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ABSTRACT

For the past several decades, the teenage birth rate in the United States has exceeded that of other industrialized nations. To explore the factors behind this high birth rate, this volume summarizes recent research conducted in the United States on the perceived causes of teenage childbearing. This review is organized around the events leading to teenage childbirth, including the transition into having sexual intercourse; use of contraception at first intercourse and use at current or recent intercourse; and, if pregnancy occurs, decisions about abortion, adoption, and marriage. Although most teens do not want to become parents, those most at risk of becoming parents during their teen years are those least well-situated to raise a healthy, well-adjusted, and high-achieving child. Factors that affect sexual and pregnancy risk-taking among disadvantaged youth are not well understood and require better data and new research; researchers would need to focus on the correlates of pregnancy prevention among low-income adolescents. The effects of varied forms of mass media, including television, music, and videos, also require better data and carefully designed empirical research. Likewise, research on the effects of policy variables, such as welfare and family planning services, remains inadequate. Results are presented in 31 tables, charts, and graphs. Contains a bibliography of over 400 items. (RJM)

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Adolescent Sex, Contraception, and Childbearing: A Review of Recent Research

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ADOLESCENT SEX, CONTRACEPTION AND CHILDBEARING:

A REVIEW OF RECENT RESEARCH

EXECUTIVE SUMMARY

Introduction

The teenage birth rate in the United States has not only been higher than teen birth rates in comparable industrialized nations for several decades, it has been rising. After increasing by a quarter between 1986 and 1991, the teen birth rate registered a tiny decline in 1992. To explore the factors that explain this very high birth rate, this paper summarizes recent research conducted in the United States on the factors that lead to teenage childbearing. This review is organized around the events leading to a birth to a teenager, including the transition into having sexual intercourse; use of contraception at first intercourse and use at current or recent intercourse; and, if pregnancy occurs, decisions about abortion, adoption and marriage.

It should be noted that even recently published studies frequently analyze data from an earlier time period. Published articles and unpublished papers from a wide variety of disciplines are included; however, the review focusses on articles representing high research standards, including representative or clearly identified samples, behavioral measures, longitudinal data and multivariate analyses. This report provides a summary of the scientific research literature. A companion volume report (Moore, Sugland, Blumenthal, Glei, and Snyder, 1995d) provides a review of intervention programs, including abstinence programs, contraceptive programs, life options approaches, and community level interventions.

The Antecedents of Sexual Activity Among Adolescents

Increasing rates of adolescent pregnancy are clearly linked to the risking incidence of early non-marital intercourse. Concern about this trend has led to a burgeoning research literature that examines the multiple and complex antecedents of adolescent sexual behavior, and a number of consistent patterns have been identified. In addition to individual factors, other influences on teen sexual behavior include the family, siblings, peers, sexual partners and the community.

There is a strong developmental progression into adolescent sexual behaviors reflected as indicated by age, menarche, levels of androgenic hormones, pubertal status and other markers of biological development. Although females begin pubertal development sooner, males are younger when they begin having intercourse. African Americans start having sex earlier than whites and Hispanics.

Frequent church attendance, supportive family relationships, better-educated parents and good grades also relate to later onset of sexual intercourse. Living in a single-parent household, using alcohol or other drugs, dating at a young age and having sexually active siblings and friends are associated with earlier onset of sexual intercourse. Troubled neighborhood contexts and non-voluntary sexual experiences also add to the risk of adolescent sexual intercourse, pregnancy and sexually transmitted infections.

In the 1990s, research about the antecedents of adolescent sexual behavior has begun to focus on several new areas that were less well understood in the 1980s. The effects of older sexually active or childbearing siblings on the sexual behavior of younger brothers and especially sisters has received significant attention and empirical support during the 1990s. Research on contextual effects also has clarified that proximal living environments and neighborhoods have an effect on the sexual behavior of adolescents, and helps to explain the large differences in sexual experience of African American and white adolescents.

Recent research has also made it clear that among females many adolescent sexual experiences are non-voluntary, especially those that occur at young ages. Further, unwanted sexual experiences and sexual abuse, because of their effects on subsequent sexual behaviors, appear to be especially important to take into account when considering major risk factors for adolescent pregnancy and sexually transmitted infections. Studies of males have been conducted, providing important new information to augment the data traditionally obtained for females.

Another way that recent studies of antecedents of adolescent sexual behavior differ from earlier research is the concern for high risk sexual behavior. Beyond the question about whether adolescents have ever had sex, research in the 1990s tends to focus more closely on factors that increase the riskiness of adolescent sexual behavior, including the early initiation of sexual behaviors, the number of sexual partners, the frequency of sexual intercourse, use or non-use of condoms, and the use of alcohol and other drugs. Studies about adolescent sexual behavior in the 1990s also differ from previous research in the extent to which data are being analyzed separately for Hispanic youth instead of grouping Hispanics and blacks into a "non-white" group.

Additional work is needed on couple dynamics (i.e., interaction between partners), peer influences and on the role of the media in hastening sexual debut among contemporary cohorts of adolescents. Strong quantitative analyses are also needed to evaluate the effect of perceptions of future opportunities on the timing of the initiation of sex.

The Antecedents of Contraceptive Use Among Adolescents

Researchers who have studied contraceptive use, both at first sex and current use, find that there are many similarities between the predictors of contraceptive use at first sex and the predictors of current contraceptive use. Older teens are found to be better contraceptors in both cases, while teens who engage in varied forms of risk-taking are less effective contraceptors. Differences are also notable, however. For example, methods requiring male involvement are more common at first intercourse, but over time couples switch from condoms and withdrawal to female methods, particularly the pill. Also, while blacks are less likely to use contraception at first intercourse than whites, they are almost as likely as whites to be current users. Not surprisingly, stronger preferences to avoid pregnancy are associated with more contraceptive use, as are more positive feelings about contraception in general and specific methods in particular. Males with more egalitarian gender role attitudes also have been found to be better contraceptors.

Research about contextual effects on contraceptive use is less conclusive. For example, recent work has not found family planning funding levels--the only proxy measure of contraceptive use available at the state level--or AFDC benefit levels to be associated with state pregnancy rates. However, in 1985, states with a coordinated pregnancy prevention program were found to have lower pregnancy rates in 1988, net of other variables.

A leading hypothesis for high rates of teenage childbearing among disadvantaged teens is the "opportunity cost" perspective which posits that teens who have little to lose due to a birth during their teen years will be less motivated to delay sex or avoid pregnancy. Given the importance of the opportunity costs perspective in discussions of adolescent parenthood, it is surprising that there is so little research examining how teens' perceptions of their future opportunities affect contraceptive use. In addition, more research is needed on whether and how the media affect contraceptive initiation and use among teens. The factors that predict early use of contraception (e.g., at first intercourse or soon thereafter) require more attention, since that is a time of high pregnancy risk. The effect of sexual victimization on whether and how consistently contraception is used subsequently has received little research attention. Also, research is needed on the factors associated with consistent, sustained and correct use of contraceptive methods.

Pregnancy Resolution: The Predictors of Abortion, Adoption and Marriage

Pregnancy is not a behavior, but rather a consequence of behaviors--sexual activity in the absence of effective contraceptive use. Once unintentionally pregnant, an unmarried teenager is faced with many choices: to carry the fetus to term and relinquish the baby for adoption; to bear the child and remain single; or to marry the child's father and jointly parent the child; or to terminate the pregnancy through abortion.

Studies examining the factors associated with pregnancy resolution indicate that teens who choose to abort and those who relinquish their babies for adoption tend to have more highly educated mothers and higher educational aspirations for themselves than those who choose to give birth and parent the child. Evidence on the influence of educational aspirations on the likelihood of marriage is mixed. A study of resolution of a hypothetical pregnancy showed a negative relationship between higher educational aspirations and the likelihood of marriage, while another study of actual pregnancy resolution found a positive relationship. Recent evidence also reinforces earlier findings that teens' decisions regarding their pregnancies are bolstered or discouraged by their families, partners, peers and social contexts. Not surprisingly, teens who choose abortion and adoption express greater acceptance for these alternatives than their peers, but they also perceive that their choices would be affirmed by their mothers if it were up to them to decide. In addition, teens are more likely to get married if they perceive that their parents expect them to do so.

The evidence for the influence of partners is mixed. Abortion is related to more distant relationships with boyfriends for teens, while findings for adoption show less of an effect of preferences of partners. One recent study showed that decisions related to adoption were not significantly influenced by the preferences of the baby's father, while another study found that the perceived seriousness of the relationship made no difference. Research also suggests that teens' pregnancy resolution decisions are influenced by the related behaviors of their peers as well as youths' perceptions of what their friends would think about their own actions.

Despite the limited number of studies on pregnancy resolution, research does indicate that decisions about abortion, adoption and childbearing among teens are not made in isolation. Studies show that opportunities, norms and social programs and policies affect individual pregnancy resolution decisions to varying degrees.

The Correlates of Having a Birth During the Teen Years

Studies of the predictors of childbearing among teens indicate that older teens, teens who accept the possibility of non-marital childbearing for themselves, teens who intended their pregnancy, teens of African-American descent, teens who engage in other forms of risk-taking, teens from single parent families and those whose families received welfare were more likely to have a birth. Teens with higher educational aspirations and those who are more successful in school are less likely to have a teen birth. Welfare benefits were not found to relate to teen births at the individual or at the state level; however, better employment opportunities have been found to be associated with a lower probability of birth. In general, teens from more advantaged communities are less likely to have a birth. Finally, although not related to pregnancy rates, state-level funding for family planning services was found to be associated with lower state-level birth rates.

Conclusions

Perhaps the clearest conclusion that can be drawn across the myriad of studies examined is that the youths most at risk of becoming parents during their teen years are those least well-situated to raise a healthy, well-adjusted and high-achieving child. Youths from economically disadvantaged families and communities, youths with substance abuse and behavior problems, youths who are behind in school and youths who have low aspirations for their own educational attainment are found more likely to initiate sexual intercourse at a young age, less likely to contracept consistently and more likely to bear a child, particularly outside of marriage. Thus the generation length is shortest for those youth who most need time to mature, to develop and to prepare for the responsibilities of parenthood. In addition, the material demands necessitated by childbearing are greatest on those whose families and communities that have the fewest resources to share. Moreover, the psychological drains are greatest on those whose development is already at greatest risk.

However, it is also very clear that most teens do not want to become parents. More research is needed regarding the motivations of that small minority who do actively want to become parents before they are socially and economically ready for parenthood in a modern industrial economy. But these adolescents are few in number. The vast majority are teens who do not want to become parents. However, the motivation of teens who do not want to become parents is not uniformly strong, and many teens feel considerable ambivalence about pregnancy.

Further research is needed on the factors that contribute to ambivalence toward pregnancy among adolescents. Better measures of pregnancy intention that capture such ambivalence are needed. Studies that explore couple dynamics could suggest intervention strategies to encourage a delay in sexual activity or better contraceptive use. The factors that affect sexual and pregnancy risk-taking among disadvantaged youth with poor prospects for the future are not well understood and require better data and new research. An approach to studying disadvantaged youth would involve examining the correlates of pregnancy prevention among low-income adolescents. The effects of varied forms of mass media, including television, music, magazines and videos, also require better data and carefully designed empirical research; little attention has been given to the topic of media influences despite the amount of time adolescents spend absorbing varied types of media. The effects of cultural norms and of contextual variables at the neighborhood, school and labor market level, in and of themselves and in tandem, have recently begun to be studied; but the literature on these factors is thin. Here too, replication studies based on sound data and using strong quantitative analyses are needed. In addition, a relatively modest number of analyses of the effects of policy variables such as welfare, family planning services, job training and child support have been conducted, and research is needed that not only explores whether they have direct and intended effects but indirect and unintended effects. Finally, research is needed on the factors that affect use and non-use of new methods of contraception that have only recently become available, specifically, Norplant®, the female condom and Depo-Provera®.

ADOLESCENT SEX, CONTRACEPTION AND CHILDBEARING: A REVIEW OF RECENT RESEARCH

I. INTRODUCTION

The teenage birth rate in the United States has been higher than the teen birth rate in comparable industrialized nations for several decades, and for many years policy makers have set reductions in the teen birth rate as a goal. For example, the U.S. Healthy People 2000 goals call for a substantial reduction in teenage childbearing (Public Health Service, 1990). Public concern and debate continues to surround adolescent sexual activity, contraceptive use, pregnancy, abortion, adoption and marriage. Despite the intense interest and controversy, the U.S. teen birth rate did not fall during the 1980s. In fact, in 1986, the rate began to rise. Between 1986 and 1991, the teen birth rate rose by a quarter, from 50 to 62 births per 1000 females aged 15 to 19. (The birth rate among females aged 10 to 14 rose from 1.3 to 1.4; among females aged 15 to 17 from 30.5 to 37.8; and among females aged 18 to 19 from 79.6 to 94.5.) In 1992, this increase was arrested and a tiny decline was documented (National Center for Health Statistics, 1994). It is too soon to know whether this change signals a turnabout; but at 61 births per 1000 females, the U.S. birth rate is still two to seven times higher than rates in comparable nations (United Nations, 1994).

To explore the factors that explain this very high birth rate, this paper summarizes recent research conducted in the United States on the factors that lead to teenage childbearing.

By 1990, a substantial amount of research literature had accumulated about the antecedents and consequences of adolescent pregnancy and childbearing. Several summaries of this literature were published in the late 1980s and early 1990s (Brooks-Gunn and Furstenberg, 1989; Hayes, 1987; Hofferth and Hayes, 1987; Miller and Moore, 1990; Voydanoff and Donnelley, 1990; White and DeBlassie, 1992). However, even the most recent summaries of this literature (Alan Guttmacher Institute, 1994; Zabin and Hayward, 1993) are based on studies conducted mostly in the 1980s and before. By contrast, the purpose of the present report is to focus primarily on original research published since 1990 in order to update and shape the previously existing knowledge base. This report is not a radical departure from the earlier research summaries, but it updates, refines and extends them to the beginning of 1995.

It should be noted, however, that recently published studies frequently cover an earlier time period. Also, this report sometimes cites findings from older studies to provide a context for more recent research. Published articles and unpublished papers from a wide variety of disciplines are included; however, the review focusses on articles representing high research standards, including representative or clearly identified samples, carefully specified measures, longitudinal data and multivariate analyses. However, some topics are so rarely studied that the only studies we could identify were those using small non-representative samples, bivariate analyses and/or less rigorous methodology. We include these studies, while recognizing their limitations, and stress that this work should be used as starting blocks for more rigorous research.

This review is organized around the events leading to a birth to a teenager, including the transition into having sexual intercourse; use of contraception at first intercourse and regular or current use; and, if pregnancy occurs, decisions about abortion, adoption and marriage.

II. SEXUAL ACTIVITY

Sexuality encompasses much more than sexual intercourse, but intercourse is the behavior that places adolescents at risk of unplanned pregnancy and sexually transmitted infections. For this pragmatic and policy relevant reason, this chapter focusses specifically on sexual intercourse as the key pregnancy risk behavior among adolescents. Since abstinence is associated with a pregnancy rate of zero, the most certain way to prevent teen pregnancy is to delay sexual intercourse. Therefore, the factors that predict whether or not an adolescent initiates sexual intercourse are explored in this chapter. [For treatments of adolescent sexuality considered more broadly, see Gulotta and Adams, 1993. Programs that seek to encourage abstinence are described in the companion volume to this report (Moore et al., 1995d).]

DATA ON ADOLESCENT SEXUAL BEHAVIOR

Obtaining complete and current statistics about adolescent sexual behavior is problematic. Estimates of the incidence and prevalence of adolescent sexual behavior are based on several sources of data that come from surveys designed for various purposes (descriptions of the different databases can be found in the appendix). The National Survey of Family Growth (NSFG) is a key data base used for this purpose. The NSFG is an excellent data base for studying the fertility-related behavior of women in the childbearing years (ages 15 to 44), including teens aged 15 to 19. However, for estimating current teen sexual behavior the NSFG is problematic because it samples only females age 15 and older, and it is not conducted annually or even on a regular basis. The fifth cycle of data collection for the NSFG is underway in January, 1995, but the previous cycle of data was collected back in 1988, and before that in 1982. Thus, "current" estimates of teen sexual behavior based on the NSFG have to rely on data collected in 1988, and then are available for females only.

Teen males have begun to be studied more systematically through the National Survey of Adolescent Males (NSAM), first conducted among males aged 15 to 19 in 1988, with a longitudinal follow-up in 1991. The NSAM is the primary source of estimates of the sexual behavior of young males (Sonenstein et al., 1991b), but these data also are several years old. Thus, the NSFG and the NSAM, both conducted in 1988, could be used to provide parallel estimates of the sexual behaviors of teen females and males in the same year, but these data are about seven years old in 1995.

The Youth Risk Behavior Survey (YRBS), conducted annually by the Centers for Disease Control and Prevention, is an alternative source of data for estimating incidence and prevalence of adolescent sexual behavior. Two versions of the YRBS exist. The first is based on a school sampling frame, and it includes both male and female adolescents in secondary schools, and is conducted annually. However, in 1992, the YRBS was conducted as a supplement to the National Health Interview Survey, which is a household survey. These data are more nationally representative because all youth are represented, not just those in school. Because reports from the YRBS usually do not provide the level of detail that would be desirable to monitor adolescent sexual behavior, we have conducted analyses on these data to assess current levels of sexual activity.

TRENDS IN SEXUAL INTERCOURSE EXPERIENCE

Most youth in the United States have voluntary sexual intercourse by their late teens, but 24 percent of females and 20 percent of males remain virgins throughout their teenage years (Figures II-A and II-B). More than half of adolescent females and nearly two-thirds of adolescent males are estimated to have had intercourse by age 18 (Figures II-A and II-B). The combination of earlier sex and delayed marriage has produced a long interval during which youth are at risk of a non-marital birth. On average, for women there are seven years and for men ten years between first intercourse and marriage (Forrest, 1993).

There are large differences in the occurrence of sexual experience by age, gender and race. Age is the most important variable in determining onset of teen sexual experience. As shown in Figures II-A and II-B, only nine percent of males and one percent of females have had intercourse by age 13, compared to 76 percent of females and 80 percent of males by age 20. In every nationally representative survey, more teen males than females report having had intercourse at every year of age. The gender difference in teen sexual experience has been declining over time, but still the proportion of teen males at each year of age who report having sex is roughly equal to the number of sexually experienced teen females who are one year older.

Race differences in adolescent sexual experience are also substantial, with more black teenagers having had sex than white or Hispanic teens. As shown in Figure II-C, more than half of non-Hispanic black males already have had sex by age 15, but Hispanic and non-Hispanic white males do not attain this level of sexual activity until they are age 17. Similarly, 45 percent of young non-Hispanic black females have initiated sex by age 16, whereas non-Hispanic white and Hispanic females do not attain this level until age 17 (Figure II-D). These racial differences are at least partly due to socioeconomic and contextual differences between the races that are discussed below.

As Hispanics represent one of the nation's fastest growing minority group, recent research has increasingly recognized the need to analyze data on sexual experience separately for youth of Hispanic origin (Day, 1992; Christopher et al., 1993; Gibson and Kempf, 1990; Hovel et al., 1994), although additional work is needed that distinguish the larger Hispanic subgroups (e.g., Mexicans, Puerto Ricans). Such studies are part of a continuing emphasis on understanding racial and ethnic differences in adolescent sexual behavior, pregnancy and childbearing (Brewster, 1994; Lauritsen, 1994).

Levels of sexual activity also vary by the educational level of the most educated parent and the family structure in which the youth lives. Figures II-E and II-F show that from age 12 to 17, adolescents whose parents have at least a college degree are less likely to be sexually active than other youth. Among males, only 19 percent of those whose parents have a college degree are sexually active before their 15th birthday compared to 38 percent of those whose parents did not graduate from high school. Similarly, among females, the respective figures are 10 percent and 26 percent. Furthermore, as shown in Figures II-G and II-H, levels of sexual activity are higher among males and females who live in a single parent family than among those living with both parents.

Change Over Time

Since the 1950s and 60s, age of first marriage has risen dramatically, from the early to mid-twenties among young females. Delayed marriage, combined with an earlier age of first sexual experience, has meant that the likelihood that a white teenage female would have intercourse before marriage more than doubled between the late 1950s and mid 1980s. As a result, 95 percent of sexually experienced white teenagers in the 1980s were unmarried at first intercourse, compared with less than 60 percent in the late 1950s (Alan Guttmacher Institute, 1994). There have been much smaller changes in the sexual behavior of black teenagers over the same period of time.

There is widespread agreement that the incidence of sexual intercourse among adolescents has increased over recent decades, but few sources of data actually address this issue. To estimate the increased prevalence of sexual activity over time, special tabulations were recently completed of the percentage of teen males and females in different age cohorts who reported having had sex by each year of age between ages 13 and 20 (Figure II-A and II-B). Comparisons were made between those who turned 20 between 1970 and 1972 versus those who turned 20 between 1985 and 1987. Among males, there is little difference between the two cohorts in the proportion who are sexually experienced by ages 13 and 14. However, an increase in sexual experience becomes apparent during the later teen years. For example, 20 percent of the earlier cohort had had sex by age 15 compared to 27 percent of those in the more recent cohort. The respective proportions for sexual experience by age 18 are 55 percent and 64 percent, an increase of nine percent.

Among females in the same two birth cohorts there was a much larger increase in sexual experience among the more recent cohort. Among the more recent cohort (who turned 20 between 1985 and 1987), 52 percent had had sex by age 18, compared to 35 percent of the earlier birth cohort (who turned 20 between 1970 and 1972); this is an increase of 17 percentage points in sexual experience. Although the percent who have intercourse in the early teen years is small, more than twice as many young females in the recent cohort have had sex by ages 14, 15 and 16, than those in the earlier cohort. As shown in Figure II-B, 5 percent of the recent cohort have had sex by age 14 compared to 2 percent of the earlier cohort. The respective figures by ages 15 and 16 are 10 percent vs. 4 percent and 21 percent vs. 9 percent.

Multiple Partners

Ever having had sexual intercourse, and especially the age of first sexual intercourse, are critically important variables for understanding risk of unplanned pregnancy and sexually transmitted infection. However, risks for negative outcomes of sexual behavior also are substantially influenced by the number of sexual partners and by the frequency of sexual intercourse.

The pattern of sexual behavior among sexually experienced but unmarried teenagers generally resembles serial monogamy. That is, like older single women, teenagers tend to have one sexual partner at a time; after a relationship breaks up, they establish another relationship. Data documenting this pattern come from analyses of the 1988 NSFG, in which only about 10 percent of single non-cohabiting women aged 15 to19 and in their 20s have two or more partners in a three-month period (Alan Guttmacher Institute, 1994). Most teenagers spend a considerable amount of time between sequential sexual partners, especially in their early relationships. Data from the 1988 NSFG show that about half of sexually experienced young women, aged 18 to 19, had not yet had a second partner 18 months after first intercourse and one-quarter still had not had a second partner after two years (Kost and Forrest, 1992). There is, however, a pattern for females who first have sex at young ages to move more quickly than older teens to subsequent sexual partners. Among females aged 15 to 17, nearly 70 percent of those who have had sex have had two or more sexual partners within 18 months after first intercourse.

In more recent analyses of the 1992 National Health Interview Survey--Youth Risk Behavior Supplement, we confirm the strong association between early initiation of intercourse and a higher cumulative number of partners in early adulthood. Among sexually active young adults age 20, 74 percent of males who initiated sexual intercourse at age 14 or younger had had six or more lifetime partners, while only 10 percent of those who did not initiate sex until age 17 or older had had six or more partners. Among females in this sample, 57 percent of early initiators--age 14 or younger--had had six or more partners by age 20 compared to 10 percent of those who initiated sex at age 17 or older.

Frequency of Intercourse

Because having sex is obviously related to there being an available partner, cohabiting or married individuals at any age tend to have sex more often than those who do not live with a partner. However, unmarried sexually experienced teenagers have intercourse less frequently than single adults. The proportion of unmarried but sexually experienced 15 to 19 year old females who have sex more than once a month was 77 percent, compared with 85 percent among single women aged 20 to 24 (Alan Guttmacher Institute, 1994). Sexually experienced, never married females aged 15 to 19 have intercourse, on average, during eight out of 12 months, but a quarter have intercourse in fewer than six months out of a year (Alan Guttmacher Institute, 1994).

THEORY

Many of the studies reviewed do not use any particular theoretical framework, and recent scholarly writings on the topic of teenage sexual behavior that are deliberately theoretical are quite rare. Udry and Campbell (1994) have conceptualized three general perspectives to organize the evidence about adolescent sexual debut. These are the sociological, the biological and the developmental (psychological) perspectives. Udry and Campbell assert that almost all of the available research is guided by sociological theory. Biological theories are best represented by the endocrine-behavior studies conducted by Udry and collaborators in the 1980s and 1990s, but could also include studies of pubertal development and menarche.

The developmental psychology perspective assumes that adolescent and adult behaviors in part have their origins in earlier periods of childhood. Scientific evidence for this perspective is problematic because the longitudinal studies required to measure antecedent child characteristics through adolescence and into adulthood are difficult and expensive to conduct. In a rare longitudinal data set that spanned from childhood to adulthood, Udry and Campbell (1994) show that early characteristics of the child (e.g., bedwetting and nightmares) and child temperament add substantially to models predicting the age of first sexual intercourse among females.

The majority of adolescent sexual behavior studies tend to take a narrower or more specific focus than the three theoretical perspectives mentioned above. Recent studies of cross-sectional data collected among 7th to 12th grade students in private secondary schools compared explanatory variables from several theoretical perspectives, including social control, containment, social learning and differential association theories (Benda and DiBlasio, 1991; DiBlasio and Benda, 1992). In general, differential peer association (for example, having sexually active best friends) was the most powerful correlate of the frequency of adolescent sexual intercourse, regardless of gender. However, the perception of the balance of rewards and costs of sex showed salient gender differences. This was a significant variable for females, but not males, probably because females more seriously weigh the consequences of pregnancy and stigma than males. On the other hand, males' but not females' sexual behavior was better predicted by drug use, possibly because males tend to engage in more deviant behavior than females.

Several other theories have been used to guide research about adolescent sexual behavior. For example, Lowenstein and Furstenberg (1991) attempted to answer the question "is teenage sexual behavior rational" by testing three theoretically defined possibilities within a decision making framework: (1) teenagers might not make rational decisions in general, about sex or about other matters; (2) sexual behavior might be more generally irrational, whether among teenagers or adults; and (3) teens might discount the consequences of contracepting because they are delayed and uncertain, whereas the costs of contracepting (e.g., embarrassment and awkwardness) are immediate and certain. The authors conclude that there is some evidence for the first two arguments, but as yet the results on the last explanation require further corroboration. That is, in their sample of teens aged 14 to 18, there was evidence that younger teens were less deliberative and rational about sexual decisions than older teens (data for adults were not available). Similarly, there is abundant evidence from this study and others, that sex is irrational, in the sense that it is often not planned, but impulsive. This is especially true for first sexual intercourse experience. Another way that the data seem to support a "sex as irrational" premise is the pattern of time inconsistency, in which teens (and others) often plan to "just say no" but end up saying "yes," and most teens think the best age to begin having sex is later than the age when they began.

Another quite widely used and influential explanation of adolescent sexual behavior is usually referred to as "Problem Behavior Syndrome" theory (Costa et al., 1995; Donovan and Jessor, 1985; Jessor and Jessor, 1977). The basis of this theory is the common empirical finding that the same adolescents tend to engage in or experience multiple problem behaviors such as alcohol and drug use, school failure and expulsion, aggressiveness and delinquency and a variety of other problem behaviors including early initiation of sexual intercourse. Explanations that emphasize "differential peer association" and the theory that there is a more general deviance trait among some adolescents (Rowe et al., 1989) have much in common with this theoretical perspective. The key theoretical ideas are the co-occurrence of problem and deviant behaviors among adolescents characterized by psychosocial unconventionality, and the association of young people with similarly troubled peers. Rowe et al. (1989) have extended these theoretical ideas to posit an epidemic model of adolescent sexual behavior in which increased association with sexually active peers simultaneously intensifies their exposure and weakens their resistance to sexually active others.

Arnett (1992) has presented evidence for a theory of reckless behavior in adolescence, including having sexual intercourse without contraception; important components of the theory are sensation seeking and adolescent egocentrism.

Moore et al. (1995c) posited four theoretical perspectives from which to examine the linkages between welfare and the timing of sexual initiation: 1) the culture of poverty or social class; 2) social isolation; 3) stressful events perspectives; and 4) utility maximization or opportunity costs. According to the culture of poverty argument, persons who face limited opportunities and who live in poor neighborhoods with high rates of crime and other dysfunctional behavior come to adopt patterns of work, marriage and sexual behavior that differ from the patterns adopted by the larger society. This perspective argues that welfare encourages and supports these behavioral patterns. The social isolation perspective emphasizes the lack of connection to the labor force that often characterizes those living in poor, especially urban, communities. Without these connections, youth cannot achieve success and find they have few alternatives to public assistance. The stressful events perspective, by contrast, emphasizes the occurrence of events such as family break-up and residential mobility that propel youth into high risk and adult behaviors, including early sex and parenthood. According to the utility maximization perspective, poor young women assess their options for school, work, marriage and economic success and accept early childbearing and welfare as a reasonable alternative given their unfavorable prospects for success in other arenas of life.

Some researchers have argued that females who grow up in poverty or in disadvantage have little to lose and some emotional and family rewards to gain from sexual activity and from having a teenage birth. For instance, Burton (1990) describes teenage childbearing and single motherhood as an "alternative life-course strategy" for low-income black families in the U.S. because of the lack of economic opportunities and the presence of family networks available for care-giving. In a study of British teens, McRobbie (1991) contends that working class girls, who are trained only for low-paying jobs in a labor market that is segregated by class and gender, cannot achieve a sense of identity through work and thus may attain social status by becoming mothers.

A number of theoretical perspectives are employed in this research on sexual activity and no one perspective dominates. Also, many studies are atheoretical *ad hoc* examinations that contribute to our knowledge base, but not to our understanding of the complex determinants of early pregnancy and childbearing. As with data, stronger theories are needed, and more theory-driven research is essential.

AGE OF FIRST SEXUAL INTERCOURSE

Whenever the risks of unplanned pregnancy and sexually transmitted infections among adolescents are focal concerns, the timing of first sexual intercourse must be an important consideration. This is partly because those who begin having sex at younger ages will be exposed to risk over a longer period of time. In addition, early initiation of sex is also associated with other behaviors that increase risk. For example, studies have found that the sexual behavior of older teenagers is influenced by the age at which they first began having sex. In one study of females aged 15 to 19 (Koyle, et al., 1989), females having an early sexual experience (at age 14 or younger) were more likely at age 19 to have older sexual partners, to have more partners in the last four weeks and to have more frequent sexual intercourse. In the same study, males aged 17 to 21 with an early first sex experience also were found to have more sexual partners and higher frequency of sexual intercourse in the recent four weeks.

Recent analyses based on data from females aged 15 to 44 in the 1988 National Survey of Family Growth (NSFG) also found that women who had an early onset of first sexual intercourse (defined as before age 17) were more likely to have had multiple recent sexual partners than women who first had sexual intercourse when they were aged 17 or older (Seidman et al., 1992 and 1994). Even in multivariate analyses (e.g., analyses which control for factors which may explain the relationship between the independent and dependent variables), age of first intercourse was an independent predictor of having recent multiple sex partners. These findings are important because they suggest that early sexual behavior has enduring effects. Those having sexual intercourse at young ages engage in subsequent sexual behaviors that put them at greater risk of negative consequences. More specifically, age of first intercourse is associated with having multiple partners and more frequent intercourse, which increases the risk of contracting sexually transmitted infections and becoming pregnant.

SEXUAL PRESSURE AND COERCION

While postponing the onset of sexual intercourse could reduce the risks of negative consequences, it has become increasingly clear from research conducted in the 1990s that many sexual experiences, and especially early sexual experiences, are not voluntary. Early sexual experiences often are unwanted, and pressures and coercion frequently are involved (Moore et al., 1989).

Pressure to have sex comes in many forms. Some children are molested or sexually abused at young ages. Some teens experience direct sexual pressures from a dating partner that range from subtle verbal and nonverbal messages to outright physical force and rape. Many teens also feel sexual pressure from the media, peer groups and friends.

Estimates of the prevalence of sexual pressure and coercion vary widely, partly because different definitions are used for what constitutes this behavior. Repeated surveys in the 1980s generally found that 25 percent to 30 percent of teenagers felt pressured by their peers to have sex. During the same years, about 25 percent of females actually experienced some form of sexual abuse (not necessarily intercourse) prior to age 18. In the 1992 Chicago Sex Survey, a national survey of adult sexual behavior, 22 percent of all women aged 18 to 59, and 25 percent of the youngest women aged 18 to 24, said that they were forced into unwanted sexual behaviors at some time, compared to just two percent of men (Michael et al., 1994).

Among youth aged 18 to 22 in the 1987 National Survey of Children (NSC), about seven percent reported that they had ever been forced to have sexual intercourse against their will (Moore et al., 1989). The percentages were higher among females than males, and the younger the age of first sexual intercourse, the greater the probability that pressure or coercion was involved. Almost three-quarters of women who had intercourse before age 14, and 60 percent of those who had sex before age 15, reported having had sex against their will (Alan Guttmacher Institute, 1994; Moore et al., 1989). From these data it would appear that force and coercion are especially important elements in understanding the onset of sexual intercourse at young ages.

One regional study (Erickson and Rapkin, 1991) found that 15 percent of a sample of 1197 6th through 12th grade students in California middle and high schools reported that they had "a sexual experience (or sexual intercourse) when they did not want to." Again, unwanted sexual experience was more often reported by females than males (18 percent versus 12 percent). Females also were almost twice as likely as males to provide written descriptions of their unwanted sexual experience, and females much more often than males (31 percent versus eight percent) reported that physical force was used on them during the unwanted sexual experience.

SEXUAL ABUSE AND ADOLESCENT PREGNANCY

In the late 1980s and early 1990s, speculation and empirical studies increased about the possible connection between sexual abuse and adolescent pregnancy. A number of mechanisms have been suggested by which sexual abuse could contribute to adolescent pregnancy (Boyer and Fine, 1992). These include pregnancy as a result of the sexual offense itself, planned pregnancy to escape an abusive situation, family dynamics reflecting incestuous role patterns, lowered self-esteem and subsequent emotional needs, sexual socialization that emphasizes self-worth based on sexuality; and the effects of trauma on developmental processes. Based on a sample of 142 females who were pregnant before age 20, Donaldson et al. (1989) also pointed out that some frequently reported negative effects of sexual abuse, such as premature and exaggerated sexual interest and vulnerability to subsequent sexual exploitation, have direct relevance to risk of teen pregnancy.

An in-depth exploratory study (Butler and Burton, 1990) of 41 young females aged 16 to 25, all of whom were pregnant as teenagers, found that more than half of them had been sexually abused in some way (molestation, forced sex, rape). This proportion of sexual abuse among pregnant teenagers is about twice as high as the commonly quoted one-in-four young females in the general population who experience some form of sexual abuse prior to age 18 (Michael et al., 1994). It is, however, consistent with an earlier Ounce of Prevention Fund study (1988) which found that over 60 percent of 445 teen mothers reported that they had been forced into unwanted sexual experiences.

Boyer and Fine (1992) conducted an ambitious field study of sexual abuse and adolescent pregnancy. Their sample consisted of 535 young females aged 17 to 21 who were pregnant as teenagers and recruited from 35 agencies in the state of Washington. Two-thirds of this sample (66.2 percent) reported some type of nonvoluntary sexual activity (including molestation, rape or attempted rape), and 44 percent reported having been raped, either prior to or after pregnancy. Analyzing their data for the timing of these events relative to pregnancy, the investigators concluded that 62 percent of their total sample had been molested or raped prior to their first pregnancy. Among these pregnant or parenting females those who reported sexual abuse had a significantly earlier age of first intercourse (13.2) than those who reported no abuse (14.5). The sexually abused young females also were much more likely to report "survival sexual experiences" which included exchanging sex for money, a place to stay, or drugs or alcohol. They are also more likely to have been expelled or to have dropped out of school, to have older sexual partners and to have used drugs or alcohol at first intercourse. The investigators concluded that sexual victimization, much more than previously recognized, is a key factor in adolescent high-risk sexual behavior and adolescent pregnancy. The sexual victimization of many pregnant teenagers might explain why rational, skills-oriented approaches to adolescent pregnancy prevention have met with limited success; voluntary and rational choices are not characteristic of the life experiences of many sexually abused adolescents. They concluded that, "for a large number of pregnant adolescents, a history of physical maltreatment and sexual victimization may have disrupted their developmental processes and undermined their basic competence" (Boyer and Fine, 1992, p. 11).

The significance of the above studies is that they provide substantial support for the hypothesis that sexual abuse is linked to a higher risk of teenage pregnancy among young females. Some clues about the mechanisms of this hypothesized linkage can be gleaned from other research (Erickson and Rapkin, 1991; Miller et al., 1995b). First, and most obvious, females who are forced to have sex at a young age are at higher risk for pregnancy and sexually transmitted infections because of their early and prolonged exposure to intercourse; by comparison, many of their peers are able to delay sexual involvement. Secondly, and probably more important, those who were forced to have sex report higher subsequent risk behaviors than those who had not reported forced or unwanted sexual experiences. These higher risk subsequent behaviors, which could be considered consequences of sexual abuse, include: (1) a younger age of first voluntary sexual intercourse; (2) lower level of contraception use at first sexual intercourse; (3) higher frequency of subsequent sexual activity; (4) lower subsequent use of contraception; (5) greater number of sexual partners; (6) higher use of drugs or alcohol; and (7) presence of mental health problems.

As concluded by Erickson and Rapkin (1991, pg. 324), "...the fact that one in seven of the young people in our sample...had experienced...an unwanted sexual contact and that these students were more likely to manifest risk-taking behavior and psychosocial problems has definite programmatic implications." Among the implications they mentioned were the need to include information about unwanted sexual activity in the medical histories of young patients, addressing the manifestations of unwanted sexual experience in educational and health care settings, and addressing the moral issues raised by the large differences between males and females in levels of reported unwanted sexual experiences.

ANTECEDENTS OF TIMING OF FIRST SEXUAL INTERCOURSE

Biological Influences

Biological explanations of adolescent sexuality are based on the premise that hormone levels and pubertal changes directly increase sexual interest, motivation and behavior. By the mid to late 1980s, cross-sectional research by Udry and colleagues (Udry, 1988; Udry et al., 1985; Udry et al.,

1986) had documented a strong association between testosterone levels and early adolescent sexual interest and behavior among young teens, especially among males.

Studies of adolescent hormones and sexual behavior still are rare in the 1990s. A three-year longitudinal investigation (Halpern et al., 1993) collected six rounds of data from 100 adolescent males who were, on average, age 13.5 when the study began in 1991. Unexpectedly, the study did not find that sexual interest or behavior increased as a function of changes in testosterone levels, casting doubt on the interpretation of earlier cross sectional studies as reflecting direct hormonal effects. The data did show, however, significant positive relationships between single measures of testosterone collected early in adolescence and both concurrent and later measures of sexual activity. The results suggest that early hormone measures reflect enduring individual differences that discriminate among males' sexual behavior.

Another recent study (Flannery et al., 1993) examined the effects of age, current pubertal status (i.e., stage of maturation selected from Tanner (1978) line drawings) and pubertal timing (i.e., being early, on time or late developing for their age) on adolescent sexual and delinquent behavior (average age in the sample was 13.5 years). In a model that was designed to compare age and pubertal status effects, age was a more consistent predictor of male behavior, whereas pubertal development significantly contributed to predicting female delinquency and sexual experience. A second approach to detecting pubertal effects independent of age was a pubertal timing analysis based on the individual's early, on time, or late pubertal development within 1-year age bands. For both genders, early pubertal maturation was related to increased heterosexual experience and more frequent delinquent behavior. Early maturing adolescents reported about two to three times the levels of sexual behavior reported by their on time or delayed peers. This study demonstrates the value of distinguishing between pubertal status and pubertal timing, with the latter variable being more predictive of behavior. Furthermore, the authors concluded that age and physical maturation are so highly interrelated (0.75 and 0.79 for males and females in this sample) that their effects can not easily be separated, but still can be viewed as different markers for social influences and physical changes.

Several recent analyses also have supported the previously reported finding that age of menarche or pubertal developmental status is related to females' age of first sexual intercourse. In a sample of youth aged 18 to 22 in 1987 from the National Survey of Children (NSC) longitudinal data, the timing of menarche influences females' age of first intercourse (Miller et al.. 1994). Additional evidence for the effects of pubertal development is provided in a longitudinal study of 76 adolescent females aged 14 to 18 living in Iowa (Whitbeck, et al., 1993). Pubertal development status measured at the base year of the study was positively related to both sexual attitudes and sexual experiences one year later. In a longitudinal sample of 473 young teens in Utah (average age 12.9 years when study began in 1991), Christopherson et al. (1994) also found that relative pubertal development status (being early, on time, or late compared to the rest of the sample) measured at the time of the initial survey was related to an ordinal measure of sexual behaviors two years later. This direct effect of pubertal development timing on sexual behaviors was stronger for males than females, and it was observed in multivariate path models that included age and other previously measured antecedent variables. Taken together, these studies provide additional evidence that hormones and biological markers associated with puberty should be included in studying the antecedents of adolescent sexual behavior.

In the most thorough recent review of biological effects on initiation of coitus, Morris (1992) suggested that young adolescents can be viewed as individuals with low hormone levels in whom an increase above a critical threshold will turn on sexual behaviors. Further, her critical analysis of existing research noted that in many studies hormones and pubertal development are observed to differ in their effects by gender and race. This observation leads to the conclusion that there most likely are subtle combined influences of biology and the social environment that are exhibited differently in the sexual behavior of adolescent males and females.

Family Influences

Many studies in the 1970s and 1980s documented the effects of family background on adolescent sexual behavior and pregnancy. Because parents' socioeconomic status, as well as parents' attitudes and marital status, are related to adolescent sexual intercourse experience, these variables continue to be included in multivariate models predicting adolescent sexual behavior in the 1990s (Brewster et al., 1993; Dorius et al., 1993; Miller, et al., 1994).

A study of females aged 15 to 24 who had premarital sex[1] during their teen years has shown that higher maternal education is related to a reduction in the probability of premarital intercourse among adolescents, and some studies show this effect to be greater among non-black adolescents (Grady et al., 1989). Examining the mechanisms through which socioeconomic status influences teen pregnancy, Hayward et al. (1992, p.770) recently summarized that "...regardless of race, mothers' education is an important inhibitor of pregnancy in terms of both retarding the onset of sexual activity and reducing the risk among sexually experienced teens."

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[1] For the purposes of this report the term "premarital sex" is defined as sex as prior to first marriage.

The relationships between adolescents' own educational investments and their sexual behaviors also continue to be studied in the 1990s. In one study (Ohannessian and Crockett, 1993), longitudinal data were analyzed separately by gender for 479 eighth to tenth grade students from a rural white sample from the mid-Atlantic region who were followed for two years. Models were tested for effects operating both ways: educational investment effects on later sexual behavior, and prior sexual behavior effects on educational variables. For females, the findings support the hypothesis that educational investment, especially as measured by grades in school, predicts subsequent frequency of sexual activity. For males, the predominant effects were in the opposite direction; frequency of sexual activity at the base year significantly predicted males' participation in academic activities two years later.

Family Structure

Prior to the 1990s, it had been well established that single parent family structure increases the risk of adolescent sexual activity. Several recent studies (Miller et al., 1994; Whitbeck et al., 1994; Wu and Martinson, 1993; Young et al., 1991; Moore et al., 1995c) have sought to refine the family structure risk variables and explore the mechanisms through which this increased risk is transmitted.

A sophisticated detailed recent analysis of family structure effects (Wu and Martinson, 1993) suggests that disruption/instability, reflected by the number of changes in parents' marital status, is the strongest influence on the risk of a premarital birth.[2] This study used a sample of women age 19 and older in the 1987-1988 National Survey of Families and Household (NSFH) to estimate age at first premarital birth. Similarly for males, Miller et al. (1994) reported that the number of changes in parents' marital status during a sons' grade school years (ages 6 to 11) was the most significant marital status variable predicting the risk of first sexual intercourse among youth in the 1987 NSC. For females, on the other hand, the percent of time spent in a single parent home from birth through age 11 was more predictive of onset of sexual intercourse, suggesting, perhaps, that socialization or lack of supervision matters more for daughters. Moore et al. (1995c), also examining the NSC, estimated time varying event history models on the transition to first sex between age 11 and 17, and found that adolescents whose families experienced a marital disruption had one and a half times greater risk of first sex than adolescents not experiencing disruption.

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[2] For the purposes of this report "premarital birth" is defines as a birth which occurs prior to first marriage.

The modeling of dating and heterosexual activity by single mothers is one of the mechanisms previously hypothesized to explain the relationship between single parent status and adolescent sexual activity. Whitbeck et al. (1994) recently reported the first direct investigation of this idea. With a sample of 174 mothers who had been divorced within the previous two years, the investigators found that mothers' dating behavior (length of time waited after divorce, number of partners and frequency of dating) was related to sexual behavior of their eighth and ninth grade adolescents, but followed different paths of influence for daughters and sons. For daughters, the effects of mothers' dating behaviors operated indirectly through effects on the daughters' sexual attitudes. Mothers' dating behaviors had no effect on their sons' attitudes, but had a direct effect on sons' sexual behaviors. These findings provide evidence that single mothers' dating experiences do influence sons' and daughters' sexual experiences. The authors suggest that one of the latent consequences of a parent's dating experiences after divorce is that it may overlap with, and provide a model for, the initial dating and sexual experimentation of their adolescent children. These intriguing results are based on a small

all white, Iowa sample, and further study among more diverse samples is needed to corroborate these data.

Religiosity

One of the most consistent empirical generalizations from previous research is that religiosity is inversely related to adolescent sexual behavior. Furthermore, based on data from mothers in the Detroit metro area who were first interviewed in 1962 and followed until 1980 when the child was interviewed at age 18, Thornton and Camburn (1989) reported that the relationship is reciprocal; religiosity reduces adolescent sexual behavior, but sexual experiences also have a dampening effect on adolescents' religious activity. The inverse relationship between religiosity and sexual behavior has been reported for both genders, but was generally thought to be weaker among males.

A sophisticated recent analysis of the effects of religiosity on adolescent sexual behavior was built on a three-year biosocial study of hormone changes and religious beliefs and practices among 100 adolescent males followed from about age 13 to 16 (Halpern et al., 1994). There were significant additive effects of free testosterone (as measured in blood plasma assays) and frequency of religious attendance on the transition to first intercourse and other aspects of sexual attitudes and behavior. Boys with higher free testosterone levels at study entry who never or infrequently attended church scored highest on the sexual attitude and behavior measures. Boys with lower free testosterone who attended church once a week or more were the least sexually permissive in attitudes and behavior. The combined effects of testosterone and religious attendance were clearer for sexual behaviors than measures of sexual ideation, motivation, or attitudes, with mean sexual behavior differences between the two extreme groups increasing over time.

A particularly interesting aspect of this study for understanding religiosity effects is that both church attendance and the subject's rating of the importance of religion were included in analytic models. While the two religiosity measures were significantly correlated with each other, church attendance was by far the more significant variable in predicting sexual behavior. Because the importance of religion variable did not alter the relationship between church attendance and sexual behavior, the authors concluded that it is involvement with religious institutions (as reflected by attendance) which plays the key role in predicting later sexual behavior, regardless of the personal significance the adolescent attaches to religion.

Family Processes and Parent-Child Relationships

Several studies in the 1990s have provided new insights about how family processes influence adolescent sexual behavior. The most detailed and intensive recent study of family process influences on adolescent sexual behavior is based on a sample of 69 boys who were studied in both the sixth and tenth grades (Feldman and Brown, 1993). Survey data were obtained from teachers, peers, parents and teens, and family interactions were observed at home to measure the quality of family relationships. Quality of family interactions, positive child-rearing practices of both mothers and fathers and parents' intact marriage were all significant inverse predictors four years later, of the number of sexual partners of adolescent boys. The findings suggested that the family environment variables influenced boys' sexual behavior both directly as noted above, and indirectly, through the teacher and peer ratings of the boys' self restraint. In additional discriminant analyses, family variables also predicted, with 70 to 80 percent accuracy, which boys would still be virgins four years later.

The results of this study are particularly important because the detailed family process measures during childhood were predictive of adolescent boys' sexual behaviors several years later. Further, it is interesting to note that single versus two parent family structure remained a significant predictor, even in the presence of the family process (e.g., interaction and parenting) variables that are sometimes speculated to explain family structure effects. The investigators also noted that the statistical models based on measures of father variables were at least as successful as models based on mother variables in accounting for sons' early sexual activity. Further, one of the likely mechanisms accounting for the link between poor parent-child interaction and adolescent sexuality is extensive peer group involvement.

In other cross-sectional multivariate analyses of teens aged 13 to 18, parental support was shown to have substantial effects on two intervening variables, depressive symptoms and alcohol use, which were both significantly related to sexual intercourse experience (Whitbeck et al., 1992). Further, the multivariate models in this study suggest important gender differences in the ways that parent-child relationships influence teen sexual behaviors. A lack of parental support was related to depression for both teen males and females, but the association between depressive symptoms and sexual activity was much stronger for females than males. Low support from parents also was associated with a greater propensity for alcohol use, but alcohol use was more strongly associated with early sexual activity among teen males than females. This study contributes to our understanding of how parent-child relationship quality influences adolescents' sexual activity through the indirect effects of parental support on teens' emotional states and alcohol use. Both females and males who viewed their parents as being unsupportive were likely to report depressed moods and use of alcohol, but depression influenced sexual behavior for females only, while alcohol use was more strongly related to the sexual behavior of males than females.

In subsequent longitudinal analyses of females in the same sample (Whitbeck, Conger and Kao, 1993), additional mechanisms were investigated. In these time-ordered data, parental warmth/support is found to have an effect on the daughters' depressive symptoms, which is subsequently related to daughters' concurrent sexual attitudes and sexual behavior one year later. Daughters' sexual attitudes were related to her perceptions of friends' sexual behaviors, which had an even stronger effect on sexual behaviors. The authors concluded that the effects of depression on sexual attitudes and behavior of female adolescents suggests that they may compensate for a lack of supportive parental relationships by becoming more involved in emotionally intimate relationships outside their families.

The studies of Feldman and Brown (1993) and Whitbeck et al. (1992) share the conclusion that parent-child relationship problems increase the influence of peers on sexual activity. Apparently, the influence of peers is increased for both male and female adolescents with poor or distant relationships with parents. This conclusion is supported by other studies among 7th to 12th graders in which association with sexually active peers is seen as reflecting a deficit or void left by weak bonding to parents (Benda and DeBlasio, 1991).

Recent analyses of 14 to 16 year old adolescents in a California volunteer sample that was 58 percent Latino (Hovell et al., 1994) have corroborated earlier findings that mothers' attitudes about sex, family rules and strictness are related to teens' sexual behavior. One result of particular interest in this study was that family communication about sex was a problematic variable; family discussion of sexual issues was relatively infrequent, was accompanied by high discomfort and was not related to adolescent sexual behavior. However, mother's attitude that her child should wait until marriage to have intercourse and the adolescent's compliance with parental rules were negatively related to adolescent sexual behavior. On the other hand, teens whose mother's with more favorable attitudes toward teen sex, those whose parents were least strict, and those adolescents who believe their mother had sex before marriage had higher levels of sexual activity. The pattern of results was similar for Latino and Anglos, except that Latino females had lower levels of sexual experience than the other ethnic/gender groups.

Parent-Teen Communication

Many studies in the 1980s reported conflicting findings about the effects of parent-teen communication on adolescent sexual behavior (Miller and Moore, 1990). The failure of these studies to establish a coherent and consistent body of evidence is, apparently, due to several substantive and methodological complexities. First, measures of the frequency, content and quality of parent-teen sexual communication vary greatly. Single items, lists of sexual issues or topics ever discussed, the frequency of sexual communication and the quality of the parents' ability to listen and be understanding are substantially different antecedents of adolescent sexual behavior. Further, some studies of parent-teen communication are cross-sectional, whereas others measure the variables over time in a temporal order suggested by theory. This is important because parents might talk most frequently about sexual issues with teens who are perceived to be at risk, of whom parents already have suspicion or knowledge of sexual involvement. Thus, some cross-sectional data collected from 12 to 14 year old adolescents in 1991 show a positive correlation between communication frequency and sexual behavior, but an inverse relationship between quality of sexual communication and adolescent sexual behavior (Miller, King, Jenson, Lee, Norton, Christopherson, 1995).

While many complexities are apparent in the parent-teen communication studies published in the 1990s, the generalization which is most consistent is that adolescents communicate about sexual issues more with their mothers than fathers (Jaccard and Dittus, 1993; Noller and Callan, 1990; Nolin and Peterson, 1992; Miller et al., 1995). The strength and direction of any relationships between parent-teen communication and adolescent sexual behavior, however, depends on parents' values and how sexual communication is measured (Jaccard and Dittus, 1991; Mueller and Powers, 1990). In one of the more sophisticated cross-sectional analyses, Jaccard and Dittus (1991) found that parents' attitudes toward sexuality are an important mediating factor between parent-teen communication and adolescent sexual behavior, and that mothers' communication was more predictive than fathers'. These results were based on analyses of data from 210 couples and their 12 to 14 year old children. The mother's attitudes about teen sex, in combination with the amount and quality of her communication, explained about one-third of the variance in teen sexual intercourse behavior. The authors concluded that parents' value orientations are highly relevant to the sexual behavior of teenagers, and that ignoring this variable may, in part, explain some of the low correlations reported in previous research. "Maternal orientations to premarital sex and the depth and quality of maternal discussion is important for influencing teen sexual activity. This is accentuated by communication honesty between mother and child as well as a supportive father..." (Jaccard and Dittus, 1991, p. 94).

Recently, Moore et al. (1995a) replicated an analysis of parent-child communication among white 15 to 16-year-olds in the 1981 wave of the National Survey of Children (NSC). Using data on youth aged 18 to 22 from the 1987 wave of the NSC, they estimated life tables on the transition to first intercourse by gender, parent-child communication and parental attitudes (defined in the 1981 data to be traditional or moderate/liberal). Females in families with traditional sex role attitudes (i.e., based on an index comprised of 3 items: better if the husband works and wife runs the home, children are better off with a stay-at-home mom, divorce causes children permanent emotional problems) whose parents communicated with them and monitored them were somewhat less likely to be sexually active; but this family influence began to wane when the young females became 17.

Sibling Effects

It still is true in the 1990s that sibling effects are relatively less studied than parental influences when examining the family as the early developmental context for adolescent sexual behavior. Siblings, however, can be powerful role models and confidantes since they occupy relatively similar locations in the family power structure. Data from the ADSEX study (a longitudinal survey of all male and female junior high school students enrolled in sample schools in a medium-size city in the Southeastern U.S. in the late 1980s; Udry and Billy, 1987) showed that younger siblings were more likely to be sexually active at any given age than older siblings were at the same age (Rodgers and Rowe, 1988). This sibling difference appeared to be larger for same than opposite sex sibling pairs, and stronger for whites than blacks.

Fortunately, the effects of siblings on adolescent risk of sexual intercourse has received substantially more specific, focussed research attention during the 1990s. Rodgers et al. (1992b) retested the birth order effects Rodgers and Rowe reported in 1988, but this time using a larger and nationally representative data set, the National Longitudinal Survey of Youth (NLSY) which includes a sample of youth aged 14 to 21 in 1979 who were followed until early adulthood in 1983. The birth order effects they reported previously--that younger siblings are sexually active at earlier ages than their older siblings--were replicated for whites and blacks, but not Hispanics. Various hypotheses were tested to explain why younger siblings might begin having intercourse sooner. The authors describe a telescoping hypothesis which suggests that younger siblings report or recall an earlier age at first intercourse than older siblings, even though their actual age is not different. This hypothesis was rejected because there was no empirical tendency for older siblings to telescope their retrospective reports forward or for younger siblings to telescope backwards. Neither opportunity nor modeling hypotheses received empirical confirmation either, although the measures used were less than optimal. Somewhat surprisingly, a biological explanation received some support; in the earlier study based on regional data, younger siblings tend to mature sooner than their older siblings. However, this result fails to account for the lack of birth order effects among Hispanics in the NLSY data. Rodgers and Rowe (1992) posed several intriguing conjectures about the source of the birth order effect. Differential parental treatment is one such possibility, in that parents, as they grow older, might decrease their supervision and monitoring of children's activities. It is also possible that older siblings serve as models for younger siblings, who see themselves as more similar in maturity and sophistication.

Our knowledge about older sibling effects was substantially extended by Haurin and Motts' (1990) analyses of over 2,000 sibling pairs in the NLSY who were aged 14 to 21 in 1979 and were followed until 1985. Their bivariate results showed that correlations between the ages of first intercourse for older and younger siblings were positive, and these bivariate correlations were strongest between siblings of the same gender within each racial group. That is, if older siblings' first intercourse occurred in their early teens, younger siblings also tended to have sex in their early years. At the bivariate level, this correlation was observed for both whites and blacks, and it was stronger for same than opposite sex sibling pairs. More important, however, was their specification and elaboration of this general finding by adding control variables to remove shared family influences. After the inclusion of control variables in multivariate models, the results were modified; the effects of the older sibling's age of first intercourse still remained, but only among whites, and the magnitude of effect was similar regardless of same or opposite sex sibling pairs. The authors concluded:

> By using a two-stage estimation technique for failure-time data, we find evidence of a direct sibling effect for white but not black youths. This effect is not inconsequential, producing as much as a one-third of a year change in age at first intercourse for a youth currently experiencing first sexual intercourse at age 17, per year change for the older sibling. Our equations clearly suggest that there are systematic background family effects that have an impact on the timing of first sexual intercourse for younger siblings, partly through the intervening effect on the older sibling's behavior. For both white boys and girls, however, there are statistically significant and substantively meaningful direct linkages between the ages of sexual initiation of older and younger siblings. In contrast, for young black males, there are virtually no significant predictors of first sexual activity, suggesting that the sexual behavior of these youths almost completely reflects forces from outside the family. This result, however, is not true for young black women, whose behavior pattern is tied more closely to earlier family attributes--but not to her older sibling's behavior (Haurin and Mott, 1990, p. 550).

Peer Influences

Based on the longitudinal ADSEX sample of junior high school students from the Southeastern U.S., Rodgers and Rowe (1990) reported that sibling and friends' deviant behavior share overlapping variance in predicting adolescent sexual experience, but the two are also separable in the sense that the sexual behavior of siblings and same sex best friends have separate and significant influences on adolescent sexual behavior. The influences of both older sisters and friends on adolescent girls' sexual attitudes and behaviors have been investigated in a series of recent cross-sectional studies (East, 1994; East and Felice, 1992; East et al., 1993). These studies generally find that having friends and sisters who are perceived to be sexually active is related to females' permissive attitudes and younger age of first sexual intercourse. In multivariate models that controlled for selected demographic characteristics and entered the independent variables together, among female adolescents aged 11 to 15, having both sexually active girlfriends and an older sister who had a child during adolescence, influenced girls' to be more sexually active (East et a., 1993). Having an older sister who had a child as an adolescent had a stronger positive effect on younger sisters' permissive attitudes and sexual experience than youth perceptions about their older sisters' sexual status. The results are important because they suggest that girlfriend and sister influences work together to influence girls' sexual attitudes and behavior.

Refinements of these analyses (East, 1994) suggest possible mechanisms by which older sisters affect younger siblings. Having a relationship with a sexually active older sister characterized as high in warmth and closeness, low in conflict and with the older sister having perceived status, was associated with sexually permissive outcomes for the younger sister. However, it also was found that perceived parent favoritism of the older sister was related to more permissive attitudes and behavior among younger sisters, suggesting that competition and rivalry might also play a role in increasing the attitudinal and behavioral likeness of sisters. These possibilities currently are being investigated in a longitudinal study of childbearing adolescents and their younger siblings (both brothers and sisters) who are being followed prospectively through adolescence (Personal communication, East, F.L., 1995).

Whitbeck et al. (1994a), in a study of the influences of parental warmth and support, adolescent depression, and peers, reported that the strongest influence on adolescent girls' sexual activity at year two was their previous years' perceptions about their close friends' sexual behavior. These data, therefore, provide strong support that the perceptions of peer behaviors influence the sexual behaviors of adolescent girls. More importantly, however, they also suggest that the effects of peer influences are due, in part, to the emotional climate of the girls' families. The quality of the parent-child relationship creates the emotional context that contributes to the relative strength of peer group influences. There is evidence that both male and female adolescents who have negative relationships with their parents are likely to compensate by establishing alternative supportive relationships among their age group (Feldman and Brown, 1993; Whitbeck et al., 1993).

Dyadic or Couple Context

Prior to the 1990s, research had shown that the onset of sexual intercourse and most ongoing teen sexual involvement takes place in dating relationships. This generalization is especially true for teenage females, and it is more true for whites than blacks. In the 1990s, the couple relationship remains important to understand as the context for most early sexual behavior. There are strong social norms about the relationship contexts of sexual intercourse (Smith, 1994). Data collected annually from the nationally representative General Social Surveys shows that adults aged 18 and older report more permissive attitudes about non-marital sex[3] for adults than for adolescents. This is true across survey years. From the mid 1980s through the early 1990s, over 85 percent of adults said that having sex before marriage was "always" or "almost always" wrong for 14 to 16-year-olds. Non-marital sexual behavior is viewed as being more acceptable when it occurs between partners who love or have strong affection for each other. It should not be surprising then, that adolescent sexual behavior usually occurs between dating partners, and the more committed the relationship (e.g., going steady or engaged rather than casual), the more likely that partners will have had sexual intercourse.

Several analyses in the 1990s have examined the timing and type of dating relationships as predictors of the onset of adolescent sexual intercourse. Thornton's (1990) detailed study of courtship and sexual behavior as a developmental process among a sample of white teens age 18 in the Detroit metropolitan area, found strong relationships between age of first date, going steady and sexual experiences. Those who began to date at early ages tended to develop steady relationships early and continued to date more often. Both the timing of first dating experience and the development of steady dating relationships were strongly related to age of first intercourse, and to the number of sexual partners and the frequency of intercourse in the later teenage years. Current sexual frequency was higher for those who began dating, steady dating and intercourse at young ages. Thornton (1990, p. 271) concluded that "...those who develop early dating and sexual relationships are more likely than others to include sexual experience within whatever level of dating and courtship relationship they might have. That is, given a level of dating and courtship relationship at age 18, those who dated early, went steady early and had early sexual experience were most sexually active at age 18."

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[3] For the purposes of this report the term "non-marital sex" is defined as sexual intercourse outside of marriage.

Two recent analyses of dating variables among youth aged 18 to 22 in the 1987 National Survey of Children (NSC) corroborate selected aspects of the findings reported above. In one study the onset of dating was found, among other life experiences, to be an important predictor of the timing of first sexual intercourse (Dorius et al., 1993). In another study of the same database, Miller et al. (1994) found that both the age dating began and the frequency of dating were significantly related to the onset of sexual intercourse. Miller et al. (1994) also examined the interaction of age and having the first date, separately for males and females, on the risk of first sexual intercourse. Plotting the odds of first sex across years of age by dating status (begun or not begun to date) and gender, the analyses suggested interesting interactions. Female daters are at much greater relative risk of first intercourse in their early teen years (ages 12 to 14) while male daters are at greater risk during the mid teen years (ages 15 to 18). The risk trajectories of daters and non-daters are also quite different by gender. For female daters the odds of first sex are consistently higher than non-daters at any age. However, among males, the odds of first sex for daters and non-daters are about the same at early ages, but become increasingly divergent at older ages. The maximum difference occurs at about age 17, with daters at higher risk of first sex than non-daters.

Gender Roles in Relationships

Research in the 1990s has supported and extended 1970s and 1980s findings that stereotypical gender role attitudes are related to adolescent sexual behavior. Foshee and Bauman (1992) used data from 1,607 adolescents aged 12 to 14 in 1985 living in 10 Standard Metropolitan Statistical Areas (SMSAs) in the Southeastern U.S. and followed until 1987 to test the relationship between stereotypical gender role attitudes measured at the base year, and whether or not young teens had intercourse two years later. In 1985, male and female adolescents were asked how much they agreed with 14 statements reflecting female stereotypes (e.g., "most women can't take care of themselves without help from men"). Scores on the female stereotype scale obtained in 1985 were used to predict the adolescents' sexual intercourse experience (had or not had coitus) in 1987. The results showed a positive relationship between strong female gender stereotyping and sex experience among female but not male adolescents. Several statistical interactions were observed, but under most conditions female adolescents with traditional female stereotypes began having sex earlier than their peers who held less stereotypical attitudes. Further, the individual attitudinal items having the strongest correlations with female sexual behavior were more explicitly sexual, for example, "most women like to show off their bodies", "most men like to go out with women just for sex", "most women are only concerned about whether men like them". The authors speculate that female adolescents who believe in such stereotypes might be more submissive to male sexual advances than their less stereotypical peers.

The study described above did not find a relationship between gender role stereotypes about females and sexual experience among adolescent males. However, in a slightly older (ages 15 to 19) sample from the National Survey of Adolescent Males (NSAM), another team of investigators (Pleck et al., 1993a) reported that young male's gender ideology is related to a broad range of heterosexual relationships. The independent variable in this cross-sectional analysis was an 8-item male role attitude index, including items measuring male status (e.g., "it is essential for a guy to get respect from others"), toughness (e.g., "a man should be physically tough, even if he's not big") and anti-femininity (e.g., "I don't think a husband should have to do housework"). In multivariate models with many personal and background characteristics controlled, traditional attitudes toward masculinity were associated with having more sexual partners in the last year, and with a less close relationship with the current sexual partner. The investigators also related young male's masculine gender ideology to a number of other variables that are significantly related to adolescent pregnancy and sexually transmitted infections. They concluded: "Traditional attitudes toward masculinity also have negative correlates from a public health perspective. Males with traditional attitudes have more sexual partners, use condoms less and have less favorable attitudes toward condoms. They disagree that males have a responsibility to prevent pregnancy, and are more likely to believe that making a partner pregnant validates their own masculinity. The greater frequency of sexual partners, lower usage of condoms and the contraceptive beliefs associated with traditional attitudes toward masculinity increase adolescent males' risk of unintended pregnancy, AIDS and other sexually transmitted diseases" (Pleck et al., 1993a, p. 26).

Community Influences

Recent research based on teen females aged 15 to 19 in the National Survey of Family Growth (NSFG) has concluded that neighborhood characteristics have an important effect on teen sexual intercourse (Brewster, 1994; Brewster et al., 1993; Billy et al., 1994). Further, because white and black neighborhoods tend to be substantially different, controlling for the neighborhood context reduces much of the racial difference in the age of first sex. In initial analyses that controlled only for age, black teenagers were 90 percent more likely than white teenagers to have had premarital intercourse. After entering individual and family background variables, such as mothers' education and marital status and respondents' education and religious affiliation, black teens still were about 50 percent more likely than whites to have had premarital intercourse. When neighborhood characteristics (such as census tract median family income, racial dispersion and proportion of women employed full time) were also included in the models, the independent risk associated with being black was reduced to 36 percent higher than the risk for being white. The proportion of women employed full time was a particularly significant neighborhood variable. Teens living where there are few adults present during the day are presumably less closely supervised and, therefore, have more opportunities to engage in sexual behavior. Brewster (1994) concluded that race differences in premarital sexual activity during the teen years are not solely a product of differences in individual level and family background factors, but are also a function of racially segregated neighborhood environments.

In additional multi-level analyses, Brewster et al. (1993) tested effects of both census tract and county contextual variables on the timing of teen sexual intercourse among non-blacks, and the use of contraception at that event. In general, the census tract-level variables, which are more proximal, have stronger relationships to the timing of teen sexual intercourse than the county-level variables. In initial models that included only contextual variables, the tract-level female divorce/separation rate and the rate of residential turnover (conceptualized as indicators of social disorganization in a community) were particularly important in increasing the risk of experiencing first sexual intercourse. Conversely, the proportion of the census-tract population with a college education, the proportion foreign born and the proportion black reduced the risk of premarital intercourse among non-black teen females. Two county-level indicators were significantly related to risk of first intercourse. Family planning clinic availability had a negative effect and the adolescent non-marital birth rate had a positive effect on coital risk net of the census-tract variables noted above. The teen non-marital birth rate was positively related to the risk of experiencing sexual intercourse, consistent with the interpretation that young female's sexual behavior is influenced by the related behaviors of teenagers in their communities.

When all of the contextual variables were combined with individual level variables, the contextual effects tended to be attenuated, and several contextual variables (family planning clinics, adolescent illegitimacy rate and proportion with college education) were no longer significantly related to risk of coitus. Still, the authors found that "characteristics of the community in which an adolescent woman resides do indeed influence her risk of becoming sexually active. The level of social disintegration characterizing the community, the community's socioeconomic status and its population composition all play significant roles in determining the timing of the transition to sexual activity" (p. 734). Given that smaller areas tend to be more homogeneous than larger aggregates, the greater significance of census tract than county level variables suggests that teen female's behavior appears to be affected more by the proximal contextual characteristics than by conditions in the larger community more generally.

The same team of investigators (Billy et al., 1994) have extended their analyses of contextual effects beyond the probability that a teen female will have premarital sexual intercourse to include the frequency and consistency of exposure to sexual intercourse among those who are sexually active. In general, the effects of contextual effects are more evident for ever having experienced premarital sex than for the frequency and consistency sexual intercourse. Many of the contextual effects reported here are anticipated by those reported in their earlier studies. For example, the more proximal contextual levels (i.e. census tracts) are more predictive of teen sexual behavior than less proximal variables (county level indicators). Also, the number of relevant community characteristics predicting teen sexual behavior is smaller for blacks than whites, consistent with many studies of individual level variables explaining the correlates of teen sexual behavior less well among blacks than whites. Again, however, these results are interesting in that they show direct effects of contextual variables such as social disorganization, socioeconomic status, religiosity, female labor force participation and family planning service availability on both white and black teens' sexual behavior. Further, in some instances the investigators reported indirect effects consistent with the idea that the contextual level variables exert their influence through the adolescent's family and individual characteristics.

Another team of investigators has analyzed contextual effects on the sexual behavior of teen males aged 15 to 19 (Ku et al., 1993a). While there are substantial differences in data sources and variables used, this analysis is conceptually similar to the studies of contextual effects on the behaviors of young females, described above. Consistent with the studies of contextual effects on young females, in these analyses both personal and neighborhood factors were found to be related to the sexual behaviors of young males, although the personal variables were generally more powerful predictors than neighborhood characteristics. Still, "the effects of the neighborhood and personal characteristics were generally independent. Including the effects of a personal characteristic did not greatly modify the effects of the corresponding neighborhood trait, and vice versa" (p. 496). The study finds evidence that economic opportunities and resources are related to male adolescents' sexual behaviors and outcomes. Specifically, young males in areas with high unemployment have more sexual partners and are more likely to have made someone pregnant or to have fathered a baby. These contextual effects are tempered, however, by the finding that it is not the individual's own lack of income or employment that is associated with greater sexual activity. At the individual level, teens from families with more money and teens who work more have more sexual partners and more frequent intercourse. The investigators explain this intriguing result as follows:

> If community career opportunities are discouraging, young men may decide to put their efforts into low-skill, low-wage work, rather than investing in further education. To young men, even low wages may be rewarding as a way of paying for dates, clothes, cars and so on, while education is an investment that may require deferring rewards. Thus, greater work effort by individual young men can be consistent with higher unemployment rates. (p. 498).

In light of these new findings about contextual effects on adolescent sexual behavior, a concluding statement by Brewster et al. (1993) is especially fitting: "The results reported here strongly reinforce the belief that the groups to which we belong, including the communities we live in, channel and constrain our behaviors, even those as profoundly intimate as sexual activity" (p. 735).

Policy Influences

Two types of public policy influences on teenage childbearing are possible and relevant. First are programs that are specifically designed to discourage or delay adolescent sexual intercourse; sex education and family life education programs frequently have this as an explicit goal. The second type of program are those which policy makers and the public fear provide incentives to adolescents to initiate sexual activity, or which remove barriers to early sex and thus allow or encourage teenagers to have sex when they otherwise would not. Welfare payments through Aid to Families with Dependent Children (AFDC) have been the focus of the latter concern for many years. In addition, there is concern that the availability of family planning and abortion services promote adolescent sexual intercourse.

For the purposes of this research review, the key issue is whether sex education, and related school-based prevention programs, make any difference in adolescents' sexual behaviors. Do sex education courses or programs influence the onset of adolescent sexual intercourse, the frequency of having intercourse or unprotected intercourse, the number of sexual partners and so on? These are complex questions to answer because there are so many sex education program variations, taught at different grade levels, and lasting different lengths of time. Furthermore, these classes and programs are targeted at different objectives that include conveying information to increase knowledge, building skills, changing attitudes or norms and affecting behavior.

In both the scholarly and popular literature, assessments continue to appear about the apparent successes (Kirby, 1992; Udell, 1995) and failures (Stout and Rivera, 1989; Whitehead, 1994) of sex education programs. While scholarly consensus has not been achieved, and there are many points of uncertainty, some points of general agreement are becoming clearer.

In the early 1990s, a systematic review of the evidence (Kirby et al., 1994) was initiated by the Division of Adolescent and School Health (DASH) within the Centers for Disease Control and Prevention (CDC). A panel of experts identified and evaluated 23 studies that had been published in peer reviewed journals. These included seven studies that used national survey data to examine the relationship between reported exposure to sex and AIDS education programs and various behavior outcomes, and another 16 experimental or quasi-experimental studies which evaluated the impacts of specific programs on sexual behaviors. Conclusions of this expert panel include the following: 1) sex education does not hasten the onset of sexual activity; 2) of four studies that examined frequency of intercourse, none reported increases and one reported a decrease; and 3) contraceptive education does not increase or hasten sexual activity, and some studies report delay of sexual onset as a result of sex education. The programs that showed the most evidence for delay of sexual onset or increased use of condoms have six common characteristics, including: 1) theoretical grounding in social learning or social influence theories; 2) focus on reducing specific sexual risk-taking behaviors; 3) experiential activities to practice and personalize the information; 4) instruction on social influence and pressures; 5) reinforcement of individual values and group norms against unprotected sex; and 6) activities to increase skills and confidence in those skills. While it is clear that not all programs are effective, some are having effects. The further recommendation of this panel is that programs should both encourage youths to delay from intercourse and also encourage them to use contraceptives if they initiate intercourse.

Analyses of data from the NSAM (Ku et al., 1992b) indicate that young males who had sex education that included instruction in resistance skills were found to have significantly fewer sexual partners during the previous year. A reduction in the frequency of intercourse during the previous year was found related to resistance training as well.

Other policy variables have also received attention. Moore et al. (1995c) used data from all three waves of the National Survey of Children (NSC) to estimate multivariate event history models of the timing of first intercourse during the years between ages 11 and 17. They investigated measures of welfare influences at the family, community and state level, as well as the interactions among these measures. Youth in states with more generous benefit levels were not more likely to initiate sex at a younger age; in addition, high benefit levels relative to family income were not associated with earlier sexual intercourse. Neither the proportion of persons on welfare nor the state benefit level relative to the average income in the teenager's zip code of residence was found to be associated with the timing of sexual debut. The only welfare variable that may have even a marginal effect on the initiation of early intercourse was an individual rather than community-level construct--receipt of welfare by both the mother and the grandmother of the adolescent--and this effect was only marginal and was found only in one model and only among females.

Ku et al. (1993a) examined the effect of the proportion of families receiving public assistance in the census tract of residence and a measure of whether the respondent's family receive public assistance on 15 to 19 year old males' sexual behavior, using data from the NSAM . These variables were not found to predict either the frequency of sexual intercourse during the previous year nor the number of partners the young men had during the previous year.

Media Influences

Although the heavy sexual content of contemporary media ranging from television, movies, radio, magazines and video games is readily documented (Brown et al., 1993; Strasburger, 1995), surprising little empirical research has been conducted on the effects of growing up in an environment saturated by models of adolescent and non-marital sex. It is obvious that mass media could have pervasive effects on adolescent sexual behavior, and these hypothesized effects have been attracting increasing attention (Greenberg et al., 1993). There are several compelling reasons why potential mass media influences on adolescent sexual behavior should be examined more thoroughly.

First, it is clear that U.S. teens have high levels of exposure to many forms of mass media. Music is the most constant, pervasive and longest exposure medium among teens, but an average of three to five hours per day also is spent by teens viewing television, in addition to their reading magazines, viewing videos, etc. (Brown et al., 1993).

Secondly, there is very high sexual content in the media, especially those most used by teens, including music and music videos, television, movies, magazines and even advertising. Content analyses are the basis for estimating that about three-fourths of popular song lyrics are about love or sex, and two-thirds of music videos portray sexual messages (Brown et al., 1993). Television depictions of sexual intimacy are increasingly explicit, and are four to eight times more common between unmarried as married partners. Teens view an average of 57 sexual behaviors on afternoon television and 143 during prime time each week (Brown et al., 1993). The typical 90 minute R-rated video is more explicit, including between 14 to 21 sexual acts that are more likely to be shown visually as compared with similar programming on television (Greenberg, et al., 1993). Third, depictions of sex by the U.S. media usually promote the desirability and pleasure of sex with little or no mention of its potential risks and negative consequences (Strasburger, 1995). Some types of media also glamorize sexual violence and exploitation of women. In content analyses of R-rated movies, for example, 80% of nude scenes depict female nudity without male nudity, and a common theme is males dominating females (Greenberg et al., 1993).

Given the above background, it is surprising that the effects of mass media on adolescent sexual behavior are not more often addressed by empirical research. Although the evidence is thin so far, a few studies have specifically tested the relationship between adolescent use of media and their sexual behavior. Brown and Newcomer (1991) related three television viewing variables (i.e., total television viewing, sexy content TV viewing and proportion of sexy TV viewing) to the transition to sexual intercourse among teens aged 13 to 18. The analyses showed that the total amount of television viewing and the amount of sexy TV viewing both were unrelated to adolescents having had sexual intercourse. There was, however, a weak but significant relationship between proportion of sexy programming and the teens' sexual status--non-virgins were more likely than virgins to watch a high proportion of programs with high sexual content. Because of the cross sectional nature of the analyses, the investigators conceded that both directions of effect probably occur: viewing sexual programming probably affects sexual behavior, and sexual behavior probably influences choice of TV programs.

Another study testing the effects of television viewing on adolescent sexual behavior (Peterson et al., 1991) examined the same dependent variable (whether the teen ever had intercourse) but was based on longitudinal analyses of the 1976 and 1981 waves of the NSC among those aged 15 to 16 in 1981. Again the overall pattern of relationships was inconsistent, with most associations being small and nonsignificant. In a few subgroup analyses with moderator variables, theoretically consistent results did emerge. Teen females who less frequently discussed TV with their parents were twice as likely to be sexually experienced compared with teens whose discussions with parents were more frequent, and teen females who reported watching TV apart from their parents were three times as likely to have had intercourse as those who reported watching with parents. These patterns were similar for teen males, with boys at the highest levels of TV viewing, who watched TV apart from their parents, being nearly six times as likely to have had sexual intercourse. The investigators concluded that their results provided little support linking the overall quantity or content of television viewing with early onset of adolescent sexual activity, because the content of favorite programs was not consistently or significantly related to sexual experience. The investigators suggested, however, that measurement is a substantial problem in these kinds of studies, where favorite television programs are used as independent variables, rather than measuring exposure to specific sexual content more precisely. These results suggest, however, that the role of parents may be critical.

In spite of the inconclusive results noted above from the most focussed correlational studies, summaries of research (Brown, et al., 1993; Greenberg, et al., 1993; Strasburger, 1995) about the media and adolescent sexual behavior have sounded a serious warning. As Brown et al. (1993) state:

> Together, television, movies, videos, popular music and print media present an impressive array of sexually oriented messages available to adolescents. From an adult's (or perhaps, more appropriately, from an adolescent's) point of view, most of these messages promote sexual behavior as desirable and consequence-free (p. 514)... The growing accumulation of experimental, survey and ethnographic studies suggests that teenagers are learning a whole array of sexual beliefs...from the mass media (p. 519). ...it is little wonder that adolescents find the sexual world a difficult and often confusing place and that they engage in early and unprotected sexual intercourse with multiple partners. We believe that all potential sex educators, including the media, must take responsibility for showing children that sex can be an important and pleasurable part of human life and relationships and that sexual behavior includes potential risks and consequences (p. 523).

These observations seem well founded and provide compelling reasons why media influences on teen sexual behavior should be examined more intensively.

Seasonality

The seasonality of first coitus (Rodgers et al., 1992a) is another example of research in the 1990s that has produced new facts about teen sexual behavior. First in the ADSEX data, and replicated in the NLSY data base, Rodgers et al. found that there is a seasonal pattern to the timing of first sexual intercourse. The risk of first sexual intercourse is noticeably highest during the summer months (June, July, August). The especially high frequency of first sexual intercourse in June suggests a "school leaving" interpretation for teen sexual onset, although the specific mechanisms that increase risk in the summer are not known (Rodgers et al., 1992a).

Overlapping Problem Behaviors

The co-occurrence of adolescent problem behaviors was an area of considerable research attention prior to the 1990s. During the 1980s and even back into the 1970s a large body of evidence was published relating early adolescent sexual activity to a variety of other "problem behaviors." There is a high degree of consistency in these findings showing that adolescent sexual behavior is related to alcohol, tobacco and drug use, school problems and cheating, delinquency and a wide variety of other deviant behaviors (Donovan and Jessor, 1985; Elliott and Morse, 1989; Jessor and Jessor, 1977; Rodgers and Rowe, 1990; Rowe et al., 1989; Rowe et al., 1989; Yamaguchi and Kandel, 1987; Zabin et al., 1986). This might constitute a general tendency toward deviance, or an adolescent "problem behavior syndrome."

In the 1990s, studies have continued to document that adolescents rarely engage in single problem behaviors, but high risk youth tend to engage in multiple problem behaviors. For example, using NLSY data Ketterlinus et al. (1992) report that sexually experienced 15 to 17 year olds were approximately one and one-half to four times more likely than virgins to have been involved in four types of nonsexual problem behaviors (school suspension or expulsion, theft, violence, drug use). These well documented relationships suggest the need to more deliberately conceptualize and study the co-occurrence of adolescent problem and risk-taking behaviors, including sexual behaviors. Consequently, several scholars have suggested a more general problem tendency or "problem behavior syndrome"[4] (Donovan et al., 1988; Donovan and Jessor, 1985; Jessor and Jessor, 1977) or deviance trait (Rowe et al., 1989).

Research during the 1990s has continued and extended this earlier research in important ways. One of the refinements of previous research has been to study the directions of relationships between adolescent sexual behavior and other problem behaviors. Elliot and Morse (1989) reported that the typical temporal sequence among adolescents in a national longitudinal sample was delinquency followed by drug use and then by sexual intercourse. The temporal sequences have been studied in greater depth.

In the NLSY longitudinal data, where variables were measured over time and retrospectively, Rosenbaum and Kandel (1990) tested the idea that drug involvement constitutes a risk factor for early onset of adolescent sexual behavior (before age 16), or whether drug use shares a common set of characteristics with early sexual activity such that the influence of drug use on sexual onset is eliminated when controls for their common antecedents are introduced. The effects of prior drug use on sexual experience by age 16 were striking for both genders, even after other variables were controlled. Compared to males with no drug use history, the risk for early sex was 39 percent higher for males reporting previous use of alcohol or cigarettes, 173 percent higher for marijuana users and

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[4] Research has shown positive correlations among a variety of adolescent problem behaviors, including alcohol use, cigarette smoking, marijuana use, use of other illicit drugs, delinquent behavior and precocious sexual intercourse and negative correlations with conventional behaviors such as church attendance.

235 percent higher for those who had also used other illicit drugs. Prior drug use effects on early sexual intercourse were even stronger for females; risks were increased by 80 percent, 245 percent and 400 percent respectively for females reporting prior use of alcohol and cigarettes, marijuana and other illicit drugs. These findings held most strongly among whites and Hispanics (especially females). Prior use of marijuana was the only predictive variable among black respondents. The authors concluded that "...when common predisposing factors are controlled, involvement with drugs and other nonnormative adolescent behaviors constitute specific risk factors for sexual activity. The earlier the involvement in drugs, the greater the risk" (Rosenbaum and Kandel, 1990, p. 796). Many other studies in the 1990s support the position that the use of alcohol and other drugs, as well as other mildly deviant behaviors, influences, or at least is correlated with, teen sexual behavior (Costa et al., 1995; Ensminger, 1990; Graves and Leigh, 1994; Resnick et al., 1993; Rodgers and Rowe, 1990). Furthermore, recent research has also focussed more closely on the relationship between high risk sexual behavior--including early initiation of sexual behaviors, the number of sexual partners, the frequency of sexual intercourse, use or non-use of condoms and other forms of contraception--and the use of alcohol and other drugs (Basen-Enquist and Parcel, 1992; Biglan et al., 1990; Cooper et al., 1994; Durbin et al., 1993; Friedman, 1992; Jemmott and Jemmott, 1993; Ku et al., 1993b; Luster and Small, 1994; Melchert and Burnett, 1990; Pleck et al., 1994).

Recent research also has examined the mechanisms and processes through which deviant behaviors influence adolescent sexual behaviors. Whitbeck, Conger, Simons and Kao (1993) tested a causal model with data collected over three years and found that early tobacco and alcohol use at year one when youth were aged 14 to 18 was related to more permissive sexual attitudes and peer relationships at year two, which in turn predicted sexual behavior at year three. These investigators concluded that the relationships between age-related deviant behaviors and sexual activity are largely due to the effects of early transitions to more permissive attitudes and peer influences. Teens who become involved with tobacco and alcohol at a young age are more likely to associate with friends who have sexually permissive attitudes and behavior. These findings are consistent with the epidemic model of adolescent sexual behavior suggested by Rowe et al. (1989), in which the increased association with peers who are sexually active intensifies adolescents' exposure and weakens their resistance to the influence of sexually active age mates.

Costa et al. (1995) reported a substantial recent replication and extension of earlier findings of Jessor and Jessor (1977) that psychosocial and behavioral unconventionality--rejection of societal norms and a propensity to engage in nonconforming behavior--predict transition to sexual intercourse. Based on four years of longitudinal data collected from seventh through ninth graders between 1989 and 1992, the pattern of relationships was highly consistent with those reported previously. Adolescents who made the earliest transition to sexual intercourse were the most unconventional group in the initial survey, and conversely, the most conventional group at the initial survey had the highest proportion who remained virgins at the fourth year survey. Over the course of the study the proportion who were still virgins among conventional youth was about double that among unconventional youth for both white and Hispanic youth, but not for black youth in this sample. The investigators concluded that the current results suggest a historical consistency in the relationship between unconventionality and sexual behavior, since these findings are comparable to those reported by Jessor and Jessor (1977) nearly 20 years ago. Early adolescent sexual intercourse can be understood as a departure from prevailing social norms, and these departures are influenced by psychosocial and behavioral tendencies toward, and controls against, adolescent problem behaviors.

Further recent specifications report that the association between problem behaviors and early onset of sexual experience are stronger among males than females aged 15 to 17 (Ketterlinus et al, 1992). The patterns are also stronger among whites than blacks (Costa et al., 1995; Ketterlinus, et al., 1992; Rodgers and Rowe, 1990). However, similar patterns of co-occurrence between adolescent sexual and other problem behaviors were observed in a sample of poor black Chicago teens aged 16 to 17 studied by Ensminger (1990). School problems, violence, drug use and sexual behaviors were intercorrelated among both males and females. Ensminger's (1990) study is unusual in that it compared earlier longitudinal antecedents going back to the first grade, for groups of adolescents who exhibited "no problems," "sex only" and "multiple problem" behaviors (noted above) based on measures of frequent involvement, rather than the timing of their initiation. The results for the multi-problem males were most consistent to other studies suggesting a general pattern of problematic or deviant behavior. Compared to "no problem" adolescents, they reported lower school attachment, greater truancy from school, had a history of aggressive behavior and lower parental supervision. Sexual activity among the "sex only" adolescents, for whom sexual activity did not occur with other problem behaviors, appeared to have a different meaning for both males and females. Parental supervision was the only common antecedent, being inversely related to all of the problem behaviors examined.

Viewed as a whole, this set of studies suggests a strong pattern of covariation among adolescent problem behaviors, including early and frequent adolescent sexual activity. These findings are most consistent for white and Hispanic teenagers. There is some indication that the co-occurrence of problem behaviors is stronger among males than females. In the 1990s evidence has become more convincing that the sequence of these behaviors usually runs from minor delinquency, substance use and deviant peer group associations to having adolescent sexual intercourse.

SUMMARY

Ever having had sexual intercourse, and especially the age at first intercourse represent critical indicators of the risk of pregnancy and sexually transmitted infections. It is important to note that sexual intercourse, especially first intercourse, is often unplanned and even impulsive and frequently unprotected by contraception. Furthermore, most teens think that the best age to become sexually active is later than the age they began. Research shows that teens who initiate sexual intercourse at early ages are more likely at older ages to have more partners, multiple concurrent partners and more frequent sex. Therefore, we examine sexual initiation as the first stage in the process leading to adolescent pregnancy.

As reflected in this review, there is a substantial literature about the antecedents of adolescent sexual behavior. The most consistent findings about the onset of sexual activity might be summarized as follows. During the second decade of life there is a strong developmental progression into sexual behaviors. That is, older age, menarche, androgenic hormones (i.e., testosterone), pubertal status and other markers of biologic development are all positively associated with increasing sexual behaviors. Although females begin pubertal development sooner, males begin having intercourse at earlier ages. Blacks start having sex earlier than whites and Hispanics, however, the racial difference in levels of sexual activity is reduced when family background and neighborhood context are taken into account. Frequent church attendance, supportive family relationships, educated parents and good grades are associated with later onset of adolescent sexual intercourse. However, a problematic parent-child relationship increases the influences of peers. Living in a single-parent household, using alcohol or other drugs, dating young and having sexually active siblings and friends hastens onset of sexual intercourse. The effects of family structure are somewhat different for males than females; among males, disruption instability is related to early sexual initiation, while among females, the proportion of time spent in a single parent home has been found to be a more important predictor. Gender role attitudes have also been found related to sexual behavior, such that traditional female stereotypes are associated with sexual experience among females and traditional attitudes about masculinity are related to having more sexual partners among males. Troubled neighborhood contexts add to the risk of adolescent sexual intercourse, pregnancy and sexually transmitted infections. In addition, adolescents subject to non-voluntary sexual experiences are at an elevated risk of having subsequent voluntary sex.

Research on the effects of public policy on sexual initiation has shown that sex education does not hasten the onset of sexual intercourse. In addition, neither AFDC benefit levels nor the proportion of welfare recipients in the teen's zip-code area have been shown to affect the timing of first sex. The only variable which may have a marginal effect, and then only among girls, is receipt of welfare or Food Stamps by both the mother and grandmother.

In the 1990s, research about the antecedents of adolescent sexual behavior has begun to focus on several new areas that were less well understood in the 1980s. The effects of older sexually active or childbearing siblings on younger brothers and especially sisters has received significant attention and empirical support during the 1990s. Research on contextual effects also has made it increasingly clear that proximal living environments and neighborhoods have an effect on the sexual behavior of adolescents, and help to explain the large differences in sexual experience of black and white adolescents. There also has been a major increase in the 1990s in the understanding that many adolescent sexual experiences are non-voluntary, especially early sexual experiences. Further, unwanted sexual experiences and sexual abuse, because of their effects on subsequent sexual behaviors, appear to be important risk factors for adolescent pregnancy and sexually transmitted infections.

Another way that studies of antecedents of adolescent sexual behavior in the 1990s differ from earlier research is the concern for high risk sexual behavior. Specifically, research has explored the relationship of early initiation of sexual behaviors, the number of sexual partners, the frequency of sexual intercourse, use or non-use of condoms and other forms of contraception, with the use of alcohol and other drugs that increase the riskiness of adolescent sexual behavior.

Studies about adolescent sexual behavior in the 1990s also differ from previous research in the extent to which data are being analyzed separately for Hispanic youth (Day, 1992; Christopher et al., 1993; Gibson and Kempf, 1990; Hovell et al., 1994). These analyses provide needed data about the sexual experience of the nations' fastest growing minority groups. Such studies are part of a continuing emphasis on understanding racial and ethnic differences in adolescent sexual behavior, pregnancy and childbearing (Brewster, 1994; Lauritsen, 1994).

Future research could address many of the limitations we find in the current literature. Much of the current research lacks a strong theoretical perspective, and are, in fact, often athereoretical *ad hoc* examinations. Stronger theories are needed. An area of research which has not been explored very well is the influences of media on sexual behavior of teens. Mass media has very high sexual content, and teenagers have high levels of exposure to many forms of media including television, radio, videos and movies, magazines, etc. These influences deserve more intense examination. Further work is needed to clarify peer and sibling influences. In addition, the continuum of sexual coercion needs further attention, as it ranges from rape involving complete force to intimidation to pressure from an older, experienced partner to sex that is initiated voluntarily. Further quantitative and qualitative research on partner dynamics is also needed. Rarely do researchers talk with both sexual partners, to compare and contrast their respective perspectives. Finally, substantially more work is needed on public policy variables, examining whether and how such factors as welfare policies, child support enforcement, subsidized contraception, the availability of health care and sex education affect adolescent sexual behavior.

III. CONTRACEPTION

TRENDS IN CONTRACEPTIVE USE

Although many adolescents are not sexually active and thus are not exposed to the risk of unintended pregnancy, by age 18, 52 percent of females and 64 percent of males have had sex. The respective proportions are 76 and 80 percent for youth by age 20 (Figures II-A and II-B). Thus, among youth turning 20 between 1985 and 1987, after their middle teen years the majority of contemporary teenagers are at risk of unintended pregnancy.

Overall, as shown in Table III-1, among females aged 15 to 19 in 1988, approximately one-half (53 percent) of these young women have had intercourse. The vast majority of these sexually experienced teens were also currently sexually active; only eight percent of all teen females had experienced intercourse, but in the past three months had not had intercourse. The proportion of females aged 15 to 19 who had ever had sex increased between 1982 and 1988, increasing the proportion at risk of pregnancy. The proportion of all teen females using reversible contraception also increased between 1982 and 1988, from 24 percent to 32 percent, and the proportion who were at risk of unintended pregnancy but were not using contraception decreased from 10 percent to nine percent.

About two in five (41 percent) of females aged 15 to 19 would be defined as "at risk" of unintended pregnancy. This is calculated by summing the proportions of teen females who are sexually active (in the past three months), not pregnant/postpartum/seeking pregnancy and fecund in 1988 (shown in Table III-1 as contraceptively sterile, reversible method users and non-users).

Among teens at risk of unintended pregnancy, not surprisingly, a very small proportion rely on sterilization as their method of contraception (see Table III-2). More than three-quarters (78 percent) use reversible contraception. Still, one in five teens who are currently sexually active and at risk of unintended pregnancy are not using any contraception (Table III-2). This group is important because they are at very high risk of pregnancy. Among 15 to 19 year olds who experience one year of intercourse using no contraception, 90 percent are estimated to become pregnant (Alan Guttmacher Institute, 1994).

Among teen females who use contraception, the methods most often chosen are the pill and condoms. Table III-3 shows that from 1982 to 1990 an increasing proportion of female teen's partners were using condoms (21 percent in 1982 to 44 percent in 1990), while pill use was on the decline. Nevertheless, 52 percent still reported using the pill in 1990. The increasing use of condoms may be due to the heightened attention in the media to the AIDS epidemic.

Contraceptive use and method choice varies by age, race/ethnicity and poverty level. Figure III-A indicates that contraceptive use in 1988 was higher among older teen females and young adult females than among those age 15 to 17. Method choice differs by age, with pill use increasing and condom use decreasing as women get older. As shown in Figure III-B, white and black females are similar in their likelihood of using contraceptives, with about four out of five using contraception; Hispanics are the least likely to use a method (65 percent use some method). However, blacks are more likely to use the pill than either whites or Hispanics. There is only modest variation by poverty status; data in Figure III-B show that although higher income (i.e., at or above 200 percent of the poverty level) teen females are the most likely to use birth control, low income (i.e., 100 to 199 percent of the poverty level) teen females are less likely to use contraception than those classified as poor teens.

Most data on contraceptive use focus on females while neglecting males as part of the process. What little research exists is primarily related to condom use. These data indicate that condom use experienced a large increase in the early to mid 1980s, no doubt due to increasing attention of the media and public to the AIDS epidemic. However, in the late 1980s and into the beginning of the 1990s, condom use did not continue the upward trend. Table III-4 shows that among urban males aged 17 to 19, condom use at last intercourse increased from 20 percent in 1979 to 54 percent in 1988. This increase in condom use among males in the 1980s appears to be primarily among males who were previously using no method or only an ineffective method. However, from 1988 to 1991, condom use among males (both urban and rural) aged 17.5 to 19 changed only slightly from 53 percent to 56 percent and was not statistically significant.

Contraceptive use at first intercourse was on the rise in the 1970s and the 1980s. In 1976, 61 percent of females aged 15 to 19 used no method of contraception at first intercourse (Figure III-C), but by 1988 this figure had shrunk to 35 percent. The most commonly used method at first intercourse is the condom, and the increase in contraceptive use in the 1970s and 1980s is found mostly in this category. The proportion of teen females using condoms at first intercourse jumped from 23 percent in 1982 to 48 percent in 1988.

Figures III-D and III-E depict contraceptive use at first intercourse by race/ethnicity and poverty status in 1982 and 1988. Whereas differences by race/ethnicity and poverty were small for current contraceptive use, differences in use at first intercourse were substantial. Despite increases in all three race/ethnicity groups, contraceptive use at first intercourse was higher among whites than blacks or Hispanics in both 1982 and 1988. Moreover, as shown in Figure III-E, contraceptive use at first intercourse was higher among those above 200 percent of the poverty level than those below in both 1982 and 1988. The increase in the 1980s in contraceptive use at first intercourse, and condom use in particular, occurred among all race/ethnicity groups and poverty status groups, yet distinctions present in 1982 were still apparent in 1988. Pill use increased among blacks, but decreased slightly among whites. Withdrawal decreased in all groups except Hispanics, where it increased from four percent to eight percent.

Simply using contraception, however, does not guarantee protection against pregnancy. Failure rates (i.e., pregnancy) among users of contraception are substantial. It is not clear whether this is due to misuse or actual method failure, but it does appear that methods which are coitus dependent, such as the condom and diaphragm, are more likely to result in pregnancy than non-coitus dependent methods, such as the pill. Table III-5 indicates that among all females under age 20, more than one-quarter experience contraceptive failure during the first 12 months of use. Also, lower income teens experience higher failure rates. Among never-married teen females, contraceptive failure is higher among those below 200 percent of the poverty level than those at or above 200 percent of poverty. The pill shows the lowest failure rates, but, even then, six percent of never married teens in the higher income category experience failure in the first year of use. Periodic abstinence, often called the rhythm method, has very high failure rates; 52 percent of low income teen females experience failure, as do 28 percent of higher income teens.

RESEARCH AND DATA ON CONTRACEPTIVE USE AMONG ADOLESCENTS

Numerous studies have been conducted regarding the determinants of teenage contraceptive use; however, much of the work is of poor quality. Hence, much of the available research serves a heuristic purpose, but should not be considered definitive. For example, studies are often based on tiny and non-representative samples, such as studies of contraception among teens who have become pregnant. Also, studies are often cross-sectional, when prospective analyses are needed to identify the determinants of contraceptive use and non-use. For example, measures of psychological variables such as self-esteem and internal locus of control[5] may be correlated with contraceptive use status at a point in time; but it is not clear whether contraceptive use is a result or the cause of psychological well-being. In addition, bivariate analyses are often presented, although multivariate controls are needed to distinguish between related but separate factors, for example, to distinguish the effects of race from the effects of poverty or low parental education. Finally, as noted earlier, because the last National Survey of Family Growth (NSFG) was conducted in 1988, the nationally representative data currently available for multivariate analysis are themselves somewhat dated. Although a telephone follow-up to the NSFG was conducted in 1990, the response rate among teenagers was fairly low. The availability of numerous articles and papers from the National Survey of Adolescent Males (NSAM), while focussed heavily on condom use, represents an important resource for an up-to-date understanding of current contraceptive use among teen males. (A description of the major data bases referred to in this report can be found in the appendix.)

Additional difficulties undermine attempts to synthesize a literature on adolescent contraceptive use (Hofferth, 1987; Morrison, 1985). One of the challenges in distilling patterns across a variety of studies is the lack of standardization of dependent variables. Some studies focus on contraceptive use at last sexual intercourse, while others examine whether an effective method is currently being used, and still others examine the proportion of intercourse acts when contraception was used. Moreover, many studies do not validate whether the variable being examined (e.g., ever-used a condom) is in fact related to the probability of pregnancy. Since the prevention of pregnancy is the crucial criterion for a method of birth control, studies that examine consistent use or use of a medical method over time may be needed at the expense of studies that examine simply whether any method at all was ever used. In addition, some studies focus on the female as informant, while others use the male as informant. Also, in some cases, studies of males are limited to condom use, while in other cases, use of any method of which the male was aware is examined. Understanding the perspective of each gender is crucial in learning about contraceptive practices; the perspectives of males and females may be very different, and we do not know the extent to which differing results reflect differing perspectives and which data are more accurate. Thus, it is difficult as yet to identify where the data provided by males and females intersect and disagree. Obviously, the use of a method of contraception can be a decision that is made and implemented by only one of the partners having intercourse; however, frequently cooperation, communication and support between partners are needed. Only rarely have the perspectives of both partners been included in research.

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[5] Internal locus of control measures the extent to which individuals believe they have control over their lives through self-motivation or self-determination as opposed to the extent that the environment controls their lives.

Samples also vary widely. Because the study of contraception among teenagers is controversial, many studies are conducted among college students, for whom sex creates less controversy. Although some college students are teenagers, we have focussed less on studies of college students because they are generally older and highly selective. Alternatively, some studies are conducted among clinic samples, who are readily accessible to researchers, but who again may not be representative of all teens. We have also avoided relying heavily on clinic samples because their selective populations preclude generalization.

A final caveat regarding current research is that virtually no studies have been done examining the factors leading women to adopt and/or use new methods including implants such as Norplant®, injectables such as Depo-Provera®, or the female condom. Data from the 1995 NSFG will provide important information about these new methods.

PATHWAYS TO PREGNANCY PREVENTION

As discussed in the previous section, efforts to encourage adolescents to delay having sex are practical and strategic. As efforts to encourage teens to delay having sex have not been highly successful to date, consideration should be given to additional pathways to the prevention of pregnancy. For those teens who have sex, we identify three overlapping goals regarding contraception.

Available data indicate that a substantial minority (21 percent) of sexually active teens who are not trying to become pregnant, nevertheless do not use contraception at all (Table III-2). These teens account for a disproportionate share of unintended teen pregnancies. Therefore, it is important that teens who have sexual intercourse without using contraception become contraceptive users. However, we have also noted that even teens who do use contraception experience high pregnancy rates. Therefore, it is also important for teens who have sexual intercourse and use contraception to use an effective method consistently and correctly. The third goal is to get teens to protect themselves and their partners from sexually transmitted infections, including AIDS, as well as pregnancy. While the focus of this paper is on pregnancy prevention, the three goals sometimes reinforce one another and at other times are in conflict, so all three goals need to be considered together.

The antecedents of contraceptive use at first sexual intercourse are explored in the beginning portion of this chapter. Next follows a discussion of the predictors of current contraceptive use.

CONTRACEPTION AT FIRST INTERCOURSE

Many pregnancies occur in the initial months of sexual intercourse (Zabin and Clark, 1981). This is a time of high risk for pregnancy because many adolescents have not established a regimen of contraceptive use. This lag occurs, in part, because they have not consciously acknowledged to themselves or others that they are going to begin or continue sexual activity. Many report that they are awaiting a closer relationship before they seek contraceptives (Zabin et al., 1991), thereby exposing themselves to a high risk of pregnancy in the early months of sexual activity. This high risk of pregnancy represents an important reason for studying the predictors of contraceptive non-use at first sex. It is also important to understand the factors that predict use of contraception at first intercourse because initial use is a predictor of subsequent contraceptive use (Pleck et al., 1988). Unfortunately, surprisingly little work has been done recently on the determinants of contraceptive use at first intercourse.

Individual Factors Affecting Contraception at First Intercourse

Pregnancy Intention

Retrospective reports from young adults age 18 to 22 in the 1987 wave of the NSC indicate that among those who had first intercourse at age 17 and younger, very few wanted to become pregnant when they first initiated sex. In fact, among both males and females and among both blacks and non-blacks, only about one in one hundred wanted a pregnancy to occur at that time (see Figure III-F). On the other hand, about one in ten non-blacks and one in five blacks reported that they did not think about pregnancy when they first had sex. Very few females reported that they "did not care" whether pregnancy occurred, but among males, six percent of non-blacks and 13 percent of blacks reported that they “did not care” whether pregnancy occurred when they had first had sex (Moore and

Peterson, 1989). Overall, among those who initiated sex as adolescents, the proportion explicitly wishing to avoid pregnancy was about eight in ten for white and for black females; among black males, the proportion fell to two-thirds. Furthermore, among teen females aged 15 to 19 in the 1988 NSFG who experienced pregnancy, 82 percent of those pregnancies are estimated to be unintended (Forrest, 1994b).

Interestingly, among youth in the National Survey of Children (NSC) who were 18 or older when they first had sex, the proportion seeking to avoid pregnancy was nine out of ten in all race and gender groups. This was notably higher than that of youth who were age 17 or younger. The age-related difference is primarily due to a reduction in the proportion of youth who did not think about the possibility of pregnancy (Moore and Peterson, 1989).

One can interpret this data to suggest the following two conclusions. First, most teens, even those who become sexually active, do not want to become parents during their teen years. Thus, the widespread perception that adolescents want to have babies is, in most cases, erroneous. Most adolescents who have sex should be viewed as receptive to the idea of pregnancy prevention. The importance of this fact cannot be over-emphasized. Most are in accord with adults in their preference to avoid pregnancy during adolescence. Second, however, there is a substantial minority of adolescents who are ambivalent (see both negative and positive aspects) or who don't care very much and who thus are at very high risk of pregnancy (Zabin, 1994a; Anderson, 1989b; Furstenberg, 1991). Zabin et al. (1993) identify ambivalence as a factor explaining a lack of contraceptive vigilance among a black, urban clinic population of females age 17 and younger in 1985-86. Even within this group, it is not that very many girls want or seek pregnancy; rather they do not care or they do not think about the risk of pregnancy. From a policy perspective, this is a more difficult group because they lack the motivation needed to be consistent and effective contraceptive users.

Age

Age at first intercourse is consistently found to be a strong predictor of contraceptive use at first intercourse (Pleck et al., 1988; Moore et al., 1995c; White and Johnson, 1988; Brewster et al., 1993). Moore et al. (1995c) use data from the 1987 survey of the NSC of young adults aged 18 to 22 to estimate a two-step model. First, sexual activity before age 18 is modeled and then, given first intercourse before age 18, contraceptive use at first intercourse is modeled. The results show that even after controlling for the factors that select teens into first intercourse before age 18, younger males and females were still less likely to use a method of birth control at first intercourse than older adolescents.

A variety of factors undoubtedly account for the negative association between age and contraceptive use. Younger adolescents are often not as able as are older persons to comprehend the risks of a probabilistic event such as pregnancy (Zabin, 1990). In particular, younger adolescents often have not achieved formal operational thinking, and are therefore less able to engage in "if-then" reasoning, to generate and evaluate a range of options to address problems, and to foresee the possible consequences of behavior such as premarital sex without contraception (Gordon, 1990). This inability to foresee likely consequences presumably accounts for the behavior of adolescents who report they did not think about pregnancy when they first had sex, a behavior which so often seems inexplicable to adults who have attained formal operational thinking. Younger adolescents may fail to use contraception because they have difficulty envisioning the range of options (e.g., consideration of different methods, refusing or delaying intercourse) available during sexual decision-making

(Gordon, 1990). Thus, when messages received from media, peers and parents conflict, the adolescent lacks the cognitive sophistication to sort through these conflicting sources of information to reach a well-reasoned decision. The lack of cognitive maturity among young adolescents may be one reason that information-based approaches to sex education have had little effect on pregnancy among adolescents.

It should be noted that many adults do not attain formal operational thinking either (Gordon, 1990), and that many other differences distinguish young adolescents from older persons. For example, younger adolescents are also more likely to be in a first romantic relationship and less likely to have accepted themselves as sexual beings. For those teens who are sexually active the process of consciously accepting their own sexual activity often takes some months, during which time contraceptive use is frequently delayed. Also, they are less likely to have the experience, finances and knowledge needed to obtain contraception; indeed, they may fear parental discovery or the disapproval of other adults because of their sexual activity at a young age (Zabin, 1990).

In addition to cognitive maturity, cognitive ability also seems to play a role in the correct and consistent use of contraceptives. Data collected between 1987 and 1990 in the Teen Parent Demonstration among a sample of disadvantaged young welfare mothers (96% under age 20) indicate that those with low levels of basic skills (reading at a sixth-grade level or lower) were less likely to use any contraceptive method or to use an effective method than those with higher levels of basic skills (Maynard and Rangarajan, 1994). In another study conducted among a lower socioeconomic status population, a test of cognitive capacity (assessing the ability to interpret puns) was administered to unmarried females aged 14 to 18 who were waiting for a medical appointment.

Cognitive capacity was found to be a significant predictor of mature contraceptive decision-making skills (Johnson and Green, 1993).

Risk-Taking

One of the most consistent findings in the existing literature, and one which is corroborated by recent research, is that youth who engage in other risk-taking behaviors are also more likely to engage in uncontracepted sex. For example, a small-scale study of female high school juniors and seniors in Atlanta found that the girls who scored high on the Sensation Seeking Scale (which includes measures of thrill and adventure seeking, disinhibition, experience seeking and boredom susceptibly) were more likely to engage in sex without contraception (Arnett, 1990). Condom use was lowest among males aged 15 to 19 in the NSAM who had used intravenous (IV) drugs or had a partner who used IV drugs, those who had sex with a prostitute, stranger or someone who has had many partners, and those who themselves have had multiple partners (Sonenstein et al., 1989a). Recent analyses of the 1991 NSAM, when males were aged 17 to 22, continue to show risk-taking to be correlated with a lower probability of condom use. That is, males who perceive their partner to be at high risk of HIV (even though presumably at higher risk) are actually less likely to use a condom at first intercourse with that partner than males who did not perceive their partners to be at high risk (Ku et al., 1994). Correspondingly, teens involved in conventional pursuits are more likely to use contraception. For example, non-black females, aged 20 and younger, in a national sample, the 1982 NSFG, who were progressing at or above grade level in school have been found more likely to use contraception at first intercourse (Brewster et al., 1993), and females 13 to 19 have been found to engage in less sexual risk-taking (defined as having more than one partner and rarely or never used contraception) if there is parental monitoring, if the mother has discussed birth control with her daughter and if the daughter has a higher GPA. Among males, GPA and parental support were found associated with less risk-taking (Luster and Small, 1994). Marsiglio (1993), using data for males aged 15 to 19 in the 1988 NSAM, finds males who have higher grades are more likely to have used effective contraception.

Gender

The method used most commonly at first sexual intercourse is the condom, a method which requires male cooperation at the very least, and typically also involves male initiative in purchasing or otherwise providing a condom. Use of condoms at first sex, as noted above, increased dramatically from 1979 to 1988 among metropolitan males aged 17 to 19, while ineffective or no use decreased just as dramatically (Sonenstein et al., 1989a). Increases in the use of condoms account for most of the improvement in contraceptive use at first intercourse that occurred during the 1980s among females (Mosher and McNally, 1991).

Race/Ethnicity

Black and Hispanic teens aged 15 to 19 are less likely to use a method of contraception at first intercourse than whites; this finding has been reported for males and for females in 1988 (Forrest and Singh, 1990b; Sonenstein et al., 1989a).

The Influence of Peers, Siblings and Partners on Contraceptive Use at First Intercourse

Partners

Surprisingly little is known regarding the influence of peers, siblings and partners on the use of contraception at first sex. In 1987, the third and final wave of the National Survey of Children was conducted when youth were aged 18 to 22. Data indicate that only about half of teens aged 17 or younger at first sex discussed using birth control with their partner before having sex the first time.

Females who were 18 or older when they first had sex were significantly more likely to have talked about using birth control with their partner before having sex the first time than females who were younger. No comparable age effects were found for males (Moore and Peterson, 1989). Not surprisingly, couples who discussed using birth control were substantially more likely to have used a method of birth control. In fact, tabulations of the 1987 NSC indicate that 92 percent of the couples who discussed using contraception used a method at first intercourse, compared with just 36 percent of the couples who did not discuss contraception.

Data from the 1979 NSAM, a sample of metropolitan males aged 17 to 21, also indicate that males with a relatively close relationship to their partner were less likely to use no method (Pleck et al., 1988). Anderson (1989b) describes a perspective found among some teen males in disadvantaged inner city areas of Chicago and Philadelphia. Some males want babies to demonstrate their ability to control a female's mind and body. However, these teen males represent only a portion of all males even in the highly disadvantaged community studied by Anderson.

Siblings

The potential influence of siblings might depend on whether or not the sibling is older than the youth in question. In addition, siblings who are considerably older might provide an experienced and protective role model, while siblings who are only slightly older might push younger teens into precocious risk-taking. The gender of the sibling might also be important, with same-sex siblings being more likely to counsel a younger brother or sister about contraception. Unfortunately, we have identified few studies and no recent studies on this topic and can only describe it as an under-researched issue.

Peers

Peers are widely believed to represent an important source of information about sex and contraception for teens; but with respect to contraceptive information, this impression appears to derive from anecdote and conjecture more than a solid research understanding. A review of earlier research (Morrison, 1985) indicates that peers were poor sources of accurate information about fertility and birth control. Recent research has not been identified.

Descriptive information is available from the 1987 wave of the NSC, youth aged 18 to 22 in were asked, "At the time you first had sexual intercourse (voluntarily), how many of your friends had had sex?". Nearly all supplied answers; very few said that they did not know. In fact, in a follow-up question, about three-quarters said they were not guessing but were pretty sure about their estimate. This certainly supports the general presumption that peer communication about sexual initiation occurs. But what is the content of that communication? Do discussions include contraception? Do peer influences include helping friends to identify and obtain methods of contraception? Do peers caution friends to use contraception correctly and consistently? Alternatively, do peers encourage risk-taking or exacerbate fears of side effects and health complications?

The availability of data from the National Longitudinal Study of Adolescent Health, known as Add Health, in 1996 or 1997 should improve our understanding of the effects of partners, siblings and peers. The data base will include information about schools and students in the schools, about friends and siblings of the teens, and about partners, as well as parents and communities. Full and early analysis of these data should represent a high priority for policy makers seeking a better understanding of the roles played by these presumably important actors.

The Influence of Parents and Family Factors on Contraceptive Use at First Intercourse

As with siblings and peers, little is known regarding the role of parents, either mothers or fathers, in encouraging contraceptive use, educating children about contraception, taking children to a doctor or a clinic, or purchasing methods of contraception. Mothers in the 1987 NSC were asked how often they (or the youth's other parent) had discussed the use of contraception with the youth during his or her "teen years." Overall, most parents reported that they sometimes or often had such discussions, and the proportions did not differ systematically by child gender or race; but the content of these discussions is not known. Interestingly, such discussions were reported more frequently by mothers who had been through a marital disruption. Mothers in intact families were considerably more likely to have never held such discussions (Moore and Peterson, 1989).

Zabin et al. (1991) report that fear of discovery by parents was a particularly important impediment among inner city females age 18 and younger who had never been to a clinic to obtain family planning services. Among those who did come to a clinic, fear of discovery by parents was more often expressed by teens seeking a pregnancy test than by teens arriving to obtain a method of contraception. Baker et al. (1988) report on the basis of a small-scale study of 14 to 17 year-olds in Seattle, Washington, that the father's and mother's tolerance or acceptance of adolescent sexual behaviors (a measure including nine items to assess tolerance for behaviors such as masturbation, homosexuality and premarital sex among adolescents) predicts greater use of contraception at first sex among both girls and boys.

Kahn et al. (1990) report that among females aged 15 to 24 who had premarital sex during their teen years, those from intact families and those with better-educated mothers were more likely to use contraception at first intercourse and condoms were chosen as a method more often than the pill. They suggest that such a pattern may reflect selectivity of partners or concern about sexually transmitted infections. However, teens from fundamentalist religious backgrounds were found less likely to use condoms than any other method or no method. In fact, these fundamentalist teens were more likely to use no method at first intercourse than teens from other religious backgrounds.

Further research is needed that differentiates between family socioeconomic influences and family processes, such as communication, values, gender roles, religious observance and parental aspirations for their children.

Beliefs and Knowledge and Use of Contraception at First Intercourse

Recent evaluations of sex education programs have provided fairly discouraging assessments of the role of educational interventions in affecting adolescent pregnancy (Kirby et al., 1994). However, this should not be taken as evidence that knowledge is irrelevant to adolescent contraceptive use. Incomplete and erroneous information have consistently been found to pervade adolescent sexuality and fertility decision-making (Morrison, 1985). Studies repeatedly show that teenagers erroneously believe that contraceptive use is dangerous (Zabin et al., 1991; Scott et al., 1988), mistake the symptoms of sexually transmitted infections for contraceptive side effects (Cates and Stone, 1992), and underestimate the probability of pregnancy for a person like themselves or believe that they are themselves somehow immune to the risk of pregnancy faced by others (Morrison, 1985). Thus, available evidence indicates that incomplete and inaccurate information among contemporary adolescents is widespread.

However, research on sex education clearly indicates that knowledge in and of itself is not sufficient to prevent adolescent pregnancy and that enhancing knowledge will not necessarily provide adolescents with the motivation needed to locate a clinic and obtain and consistently use a method (e.g., Kirby et al., 1994). Nevertheless, accurate information on, for example, the safety of medical methods of contraception for young women (Kost et al., 1991) should eliminate barriers to contraceptive use. Thus, if inaccurate information is the barrier to use, enhancing knowledge could be expected to have a positive effect on contraceptive use. On the other hand, if the barrier is motivational, knowledge enhancing programs can be expected to have little effect. Given widespread evidence of incorrect and incomplete contraception information, research is needed on the kinds of misperceptions and information needs of adolescents. Focus groups conducted in varied settings with varied sociodemographic groups have highlighted the difficulty adolescents and even young adults have in discussing and negotiating the use of contraception (Landry and Camelo, 1994; Wingood, Hunter-Gamble and DiClemente, 1992). Therefore, in addition to providing accurate information, sex education programs need to help youth develop the interpersonal skills in communication and negotiation needed to initiate and sustain contraceptive use.

Media and Contraceptive Use

The media represent a potential source of accurate information about methods of contraception (Brown et al., 1993). However, while teens are frequently exposed to sexual innuendo and depictions of sexual activity, particularly non-marital sex, there are rarely models of contraceptive use in the media. Also, contraceptive advertising is very limited, so information about various methods and where to obtain them is not readily available. Moreover, teens are provided with little assistance to evaluate media depictions of sexual activity (Brown et al., 1990). Whether changes in the content of the media are needed or appropriate, research might focus on assessing strategies designed to help adolescents evaluate media images and messages.

Public Policy Variables and Contraceptive Use at First Intercourse

Studies of sex education, as noted above, are inconsistent in finding sex education to be associated with improved contraceptive use (e.g., Dawson, 1986; Marsiglio and Mott, 1986; Brewster et al., 1993; Kirby et al., 1994). Many programs reach students only after they have become sexually active, however, losing the prospect of affecting initial contraceptive use. Programs also vary greatly in their approach. On the basis of their review of programs evaluated to date, Kirby et al. (1994) identify the characteristics of programs that affect adolescent sexual and contraceptive behavior to include a narrow focus on reducing sexual risk-taking, a foundation in social learning theory, basic accurate information about the risks of unprotected intercourse and ways to minimize these risks, activities that focus on media and social influences on sexual behavior, clear and appropriate values (i.e. specific values or norms that were tailored to the age and experience of the target population), and opportunities for modeling and practicing skills in communication and negotiation.

Moore et al. (1995c) conducted analyses on data from the 1987 wave of the NSC that examined the effects of several public policy variables on contraceptive use at first sex, net of factors selecting adolescents into sexual activity before the age of 18. Living in a zip code in which a high proportion of residents received welfare was not found to effect the probability of using contraception at first intercourse for either boys or girls. AFDC benefits in the state of residence were not related to contraceptive use at first intercourse among girls and were only marginally significant among boys. However, the effect of benefits among boys was positive: that is, higher benefits were marginally associated with a greater likelihood of contraceptive use at first intercourse. Residing in a family that received welfare was not found to affect reported contraceptive use for boys; but being raised by a mother who received welfare (AFDC or Food Stamps) was associated with a significantly lower probability of using contraception at first sex for girls.

Brewster et al. (1993) examined the determinants of contraceptive use at first intercourse among non-black young women, age 20 or younger, in the 1982 NSFG. They found the proportion of women divorced in the census tract of residence to be related to a higher probability of unprotected premarital intercourse, while better labor force opportunities[6] for women in the census tract were related to an increase in the probability of contraceptive use at first intercourse, over and above the influence of numerous other individual and community level variables. They did not find the availability of family planning service to influence the probability of contraception at first intercourse, which is not surprising given the widespread reliance of teens upon non-medical methods when they are first initiating sex.

CURRENT, RECENT, OR CONSISTENT CONTRACEPTIVE USE

As noted with studies of contraceptive use at first intercourse, the definition of current contraceptive use varies substantially from study to study. These differences may explain some of the inconsistencies in findings across studies. On the other hand, when findings are robust across studies, greater confidence can be placed in the results.

Current Contraceptive Use and Individual Factors

Age

As one might expect, given the positive association between age and contraceptive use at first intercourse, current age and current contraceptive use are also positively associated (Alan Guttmacher

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[6] The expected number of jobs for women workers relative to the potential supply of women workers, taking into account the sex-segregated nature of the labor market (Nakamura et al., 1979).

Institute, 1994; Sonenstein et al., 1989a). As shown in Figure III-A, 72 percent of females aged 15 to 17 who have ever had sex report using a method of contraception compared to 84 percent of 18 to 19 year olds. Among never-married, sexually active males in the 1988 NSAM, 36 percent of 15 year olds used an ineffective method or no contraception method at last intercourse, compared to only 18 percent of 18 year olds and 22 percent of 19 year olds (Sonenstein et al., 1989a).

Gender

Not surprisingly, females aged 17 to 23 have been found to rate the severity of unplanned pregnancy significantly more negatively than males, in terms of impact on career, parents and self (Norris and Devine, 1992). While studies regularly indicate that male methods, including condoms and withdrawal, are common at first intercourse, studies also uniformly show a shift to female methods over time (Sonenstein and Pleck, 1994).

Risk-Taking

Whatever the measure of risk-taking or of contraceptive use, more risk-taking is found to be correlated with lower levels of contraceptive protection. For example, Ku et al. (1992a) report that among males aged 15 to 19, frequency of condom use is negatively correlated with alcohol and cocaine use. Similarly, Massachusetts teens aged 16 to 19 in 1988 who reported heavy drinking (having had five or more drinks in one day) and marijuana use were also less likely to report using condoms (Hingson et al., 1990). Herceg-Baron et al. (1990)[7] found Philadelphia females aged 13 to 17 attending a family planning clinic were less likely to be continuous contraceptive users if they were risk-takers. Galavotti and Lovick (1989) reported that 9th and 10th grade students in a large urban high school in Texas who scored high on an index of risk-taking behaviors, such as alcohol use, carrying a knife, shoplifting, drug use and smoking were less likely to be frequent contraceptive users in 1985. DiClemente et al. (1992) found that sexually active, inner-city adolescents, aged 11 to 16, in predominantly non-white junior high schools in 1988 (among sexually active sample, 58 percent black, 21 percent Latino and 11 percent Asian) who have had three or more partners are less likely to always use condoms during intercourse. Also, Herceg-Baron et al. (1990) found that girls aged 13 to 17 with low grades were less likely to be continuous contraceptive users.

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[7] Date of data collection was not stated in the article.

Measures of conventionality are often viewed as the opposite of risk-taking, and these measures do indeed tend to be associated with better contraceptive use. For example, Calhoun et al. (1993) reported that males aged 15 to 19 who are not behind in school are more likely to be consistent condom users, and that placing importance on religion has a positive effect on condom consistency. Kraft and Coverdill (1994) studied the effects of work involvement and schooling among young women in the 1983, 1984 and 1985 NLSY who were single, sexually active, not pregnant and not mothers.[8] They report that the effects of family backgrounds are minimal at these ages, while the women's own educational and occupational attainments have very significant effects. In particular, those who had worked more months during the previous two years were more likely to use contraception. In addition, higher average wages during the previous two years were linked to more consistent contraceptive use, a result which was of marginal statistical significance among whites and blacks but very strong among Hispanics.

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[8] Women in the NLSY were aged 21 to 25 in 1983 and aged 23 to 27 in 1985. Data for each woman was used from the 1983 survey if she met the criteria for the study. Otherwise, data from 1984 or 1985 was used, the earliest year in which she met the requirements of the study sample. Data for each woman was used from only one year of the survey; they were not double counted.

In addition, concern over getting a sexually transmitted infection is related to taking steps to prevent sexually transmitted infections. Teens aged 16 to 19 who perceived themselves to be susceptible to AIDS were also more likely to use condoms than teens who did not feel vulnerable (Hingson et al., 1990). In addition, among males aged 15 to 19, Pleck et al. (1991) report that, although worry about AIDS is correlated with consistency of condom use, actually having three or more partners in the last year was negatively related to consistency of condom use.

Luker (quoted in Philliber and Namerow, 1990) has proposed a "feedback effect" such that teens who take chances but do not become pregnant lower their estimate of the probability of pregnancy. This encourages them to feel they can take more risks. Philliber and Namerow (1990) find, in accordance with this suggestion, that among teen females aged 13 to 19 attending a multi-service center in New York City in 1981, those who used contraception sporadically or not at all and did not become pregnant were more likely to take a risk the last time they had sexual intercourse than girls who had experienced pregnancy. Similarly, Balassone (1989) reports from data collected in 1986 from girls aged 17 and younger, in a small clinic in Oakland, California that some girls who discontinued contraception perceived themselves as less likely to become pregnant because pregnancy had not yet happened to them.

Attitudes

Negative attitudes about methods of birth control are fairly widespread (Morrison, 1985). Among women aged 15 to 44, the only methods that receive a favorable rating are the pill (77 percent favorable), condoms (68 percent favorable), and sterilization (62 percent favorable for vasectomy and 57 percent favorable for female sterilization) (Forrest and Fordyce, 1993). While many women voiced no opinion about methods, approximately a third or more of all women were unfavorable about the diaphragm, foam, jelly, cream, IUD, rhythm, withdrawal, douche, sponge and suppositories.

A number of studies have examined attitudes about condoms and concluded that youth who hold various negative attitudes are less likely to use condoms. However, since many of these studies are cross-sectional it is impossible to establish causality; it is possible that condom use influences attitudes about condoms (i.e., males who have used condoms develop more positive attitudes about them and dispel the negative perceptions they once had). For example, in a Massachusetts telephone survey of teens aged 16 to 19 (Hingson et al., 1990), teens who perceived that condoms do not reduce pleasure, teens who said they would not feel embarrassed being asked to use a condom and those who believed condoms were effective in reducing HIV transmission were more likely to report that they always use condoms. Similarly, in a small sample of San Francisco teens aged 14 to 19, those who viewed condoms as easy to use, as allowing sex on the spur of the moment and as popular with peers were more likely to have an intention to use condoms, while those who perceived condoms as uncomfortable or painful were less likely to intend to be users (Kegeles et al., 1989). Data from a sample of low income, black females aged 13 to 18 who were interviewed while they were waiting for an appointment at a school-based clinic, also indicated that those who saw more benefits and fewer barriers to contraception were more likely to be active contraceptors, as were those who felt more likely to become pregnant (Keith et al., 1991).

Analyses of young men of similar age in 1988 and 1991 (17.5 to 19 years of age) indicate a decline from 1988 to 1991 in the proportion who associated condoms with a reduction in pleasure and an increase in the proportion who perceived partners to appreciate condom use; however, a decline in the perceived risk of AIDS was found in all race/ethnicity subgroups (Pleck et al., 1993b).

Several older (Morrison, 1985) as well as more recent (Pleck et al., 1993a) studies have found that feminist and egalitarian attitudes (e.g., greater acceptance of non-traditional roles for women) also predict teen contraceptive use. Similarly, adolescent males aged 15 to 19 who feel that men have a responsibility for birth control are more likely to be consistent users of condoms, as are those who believe that a partner would appreciate condom use. Teen males who worry about getting AIDS are more likely to use condoms and, contrary to expectations, so are those who believe their parents might find out he has condoms (and this consequence matters to him). On the other hand, those who believe condoms reduce pleasure and those who find condoms embarrassing were less likely to be consistent condom users (Pleck et al., 1991).

Internal Locus of Control has been found to be associated with a lower probability of unprotected intercourse among black teen males, aged 15 to 19 (Sonenstein et al., 1992b). Morrison (1985), reviewing several older studies, suggests that locus of control is associated with overall use versus non-use, rather than the choice of any particular method of contraception.

Not surprisingly, wanting to avoid pregnancy is a predictor of contraceptive practice. Zabin et al. (1993) have developed a multidimensional measure of pregnancy wantedness.[9] Compared to a single item measure, the multi-item wantedness indicator had a stronger and more linear relationship with later effective contraceptive use. Among black females age 17 and younger, a positive attitude toward contraception also predicted subsequent contraceptive use net of background factors.

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[9] The multi-dimensional measure of wantedness included a question about whether the respondent wanted to become pregnant before she thought she was pregnant, a question about how happy she would be if she found out she was pregnant and a question assessing how much of a problem the respondent thinks having a baby now would be.

Race/Ethnicity

Although black and Hispanic males aged 15 to 19 in the 1988 NSAM were less likely to use condoms at first intercourse than whites, black males were found to be more likely to use condoms at last intercourse than either white or Hispanic males (Sonenstein et al., 1989a). Similarly, based on the same data, black teen males were more likely to be consistent users of condoms (Pleck et al., 1991); on the other hand, black teen males were also more likely to have unprotected intercourse in the past year (Sonenstein et al., 1992b). Among females in the 1988 NSFG current contraceptive use is similar among blacks and whites (77 and 81 percent, respectively), however, contraceptive use is lower for Hispanics (65 percent), as shown in Figure III-B.

Previous Contraceptive Use

Not surprisingly, but very important, is consistent evidence that previous and early use of contraception is a strong predictor of current contraceptive use (Durant et al., 1990a; Durant et al., 1990b; Herceg-Baron et al., 1990). Whether this strong association reflects selection into initial contraceptive use, a feedback effect from positive experiences with using contraception, or ongoing and consistent influences from family, peer, social context and individual goals has not yet been determined.

Current Contraceptive Use and Family Variables

Families can affect adolescents continued and consistent contraceptive use by either providing communication, information and motivation to obtain contraceptives, by providing the economic resources to make contraception attainable, or by discouraging and undermining the use of contraception.

Research on family income has generally presumed that income would be positively associated with the use of contraception. However, Ku et al. (1993a) did not find family income to be a significant predictor of the use of effective contraception at most recent intercourse among a nationally representative sample of males aged 15 to 19 in the 1988 NSAM. In fact, an analysis of black teen males found that those from higher income families were less likely to be consistent contraceptors and more likely to have unprotected sex, net of other factors (Sonenstein et al., 1992b). Family economic position is only marginally related to the current use of contraception among teenage females who have had sex. As shown in Figure III-B, 78 percent of poor teenage females were using a method of contraception, compared to 71 percent of low income teens and 83 percent of higher income teens. The relatively high use among poor females may reflect access to subsidized contraceptive services.

Several studies have explored the effects of parental communication. In general, results suggest that communication is associated with better contraception. Zabin et al. (1992) selected a sample of females age 17 and younger who arrived at a clinic to get a pregnancy test in 1985-1986 and followed these young women for a period of two years. Those girls who had talked with a responsible adult (e.g., their mother) before the pregnancy test were significantly more likely to be using contraception at the time of the two-year follow-up. However, the self-administered mail questionnaire of the 1994 Ortho Birth Control Survey of women 15 to 50 found that only one-quarter of the mothers had counseled their daughters regarding birth control. Of those who did discuss birth control, the methods recommended by mother to daughter most often include the pill (68 percent), condom (47 percent) and Norplant® (11 percent). Joint use of the pill and condom was recommended by 37 percent of the mothers (Fordyce, 1994).

Casper (1990) studied females 15 to 19 in the 1982 NSFG. She found teens from families that had ever discussed contraception with the youth were more than twice as likely to be practicing contraception, net of a number of background factors. It is not clear, however, whether discussion of contraception between parents and youth causes increased contraceptive use, or if instead, youth who use contraception talk to their parents in order to obtain a medical method such as the pill, for example.

Among non-black males aged 15 to 19 interviewed in the 1988 NSAM, family strictness had a positive association with contraceptive consistency and a negative association with unprotected intercourse. Males living with their parents were less likely to have unprotected sex, while those who were engaged or cohabiting were more likely to have unprotected intercourse. Males whose mothers were teenage mothers themselves and whose mothers were employed were more likely to have unprotected sex (Sonenstein et al., 1992b).

Several studies have examined religiosity as a predictor of contraceptive use without finding an association (Herceg-Baron et al., 1990; Pleck et al., 1990; Visher, 1986), although Ku et al. (1992b) report that males aged 15 to 19 with no religious preference were less likely to be consistent condom users, and Calhoun, Sonestein, and Ku (1993) found condom consistency to be higher among males who place importance on religion.

Influences of Peers and Partners and Current Contraceptive Use

Sonenstein et al. (1994) report that more than three-quarters of white males aged 15 to 19 in the 1988 NSAM, 72 percent of Hispanic males, and 51 percent of black males feel that their parents would be very upset about a pregnancy; however, only one-quarter report that their peers would be very upset[10]. Reporting expected negative reactions to pregnancy was positively related to using contraception at intercourse.

Wilson et al. (1994) report from a study of 241 black males aged 11 to 19 attending an urban medical clinic in 1985-86 that those who communicated with their partner about sex prior to intercourse were no more likely to have used contraception, but those who communicated about contraception were more likely to have used condoms.

Community Factors and Current Contraceptive Use

Ku et al. (1992a) report that condom use among males aged 15 to 19 in the 1988 NSAM is highest in the Midwest and lowest in the Northeast and the West. They also find that males living in metropolitan areas are less likely to report condom use. Despite the theoretical importance of other community variables assessing access to contraceptive services, education and economic opportunities and community values, recent work on these topics has not been identified.

Policy Variables and Current Contraceptive Use

Sonenstein et al. (1994) have examined young males aged 15 to 19 in the 1988 NSAM and found no significant effect of knowledge about child support obligations on the level of unprotected intercourse. In another analysis of the same data, Ku et al. (1992b) report that AIDS education, resistance skills education and birth control education all had significant positive effects on the propensity of teenage males to be consistent condom users. The authors note that it may not be the effectiveness of resistance skills *per se* that is important, because teaching such skills generally takes place in the context of a class that provides other kinds of instruction as well. The types of instruction that affect adolescent behavior represents an important topic for future research.

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[10] Exact question wording, "If you got a girl pregnant now, how would your parents react?" and "...., how would your friends react?"

Moore et al. (1994) examined the effects of varied public policies and state-level context on state-level pregnancy, abortion and birth rates among females aged 15 to 19. Although state-level data on contraceptive use at first intercourse do not exist, the effect of public policies on teen pregnancy rates represent a crude proxy. Analyses of data for 1988 found no association between state-level pregnancy rates and the proportion of teens at risk of unintended pregnancy who were served in clinics funded by Title X of the Public Health Service Act. Similarly, no effects were found between pregnancy rates and a measure of public dollars spent on contraceptive services in a state in 1987. Funding levels for family planning services eroded substantially during the 1980s (Gold and Daley, 1991), so perhaps it is not surprising that funding for contraception was unrelated to state-level pregnancy rates in the late 1980s.

An earlier study found effects of family planning on the incidence of reported pregnancy. Among white females age 14 to 16 in 1979 and followed until 1986 in the National Longitudinal Survey of Youth, Lundberg and Plotnick (1990) found that premarital pregnancy[11] was more common in states with restrictive laws regarding contraceptive licensing, advertising, or selling, net of family background measures.

Other state to level analyses reported by Moore and colleagues (1994) show a consistent correlation between a higher violent crime rate and a higher teen pregnancy rate, a negative association between female unemployment and the teen pregnancy rate, a marginally significant positive association between public funding for abortion in 1987 and the teen pregnancy rate in 1988, and no association between state AFDC benefit levels and state teen pregnancy rates. The presence of coordinated[12] programs and policies for addressing teen pregnancy and parenting at the state level in 1985 (Koshel, 1990) was found to predict a lower teen pregnancy rate in 1988 (Moore et al., 1994).

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[11] For the purposes of this report "premarital pregnancy" is defined as a pregnancy which occurs prior to first marriage.

Maynard and Rangarajan (1994) found that teen mothers in the Teen Parent Demonstration (see the companion volume, Moore et al., 1995d, for a more detailed description of the program) who completed a lengthy and comprehensive workshop on family planning offered at one of the sites were more likely to use contraception and use an effective method than those who did not participate in or complete the workshop. However, this effect did not translate into a lower probability of repeat pregnancy. The New Chance evaluation (Quint et al., 1994) found that disadvantaged young mothers (who were aged 16 to 22 at first birth) in the experimental group, who had been exposed to contraceptive education, were somewhat less likely to be currently using a method of contraception regularly than the control group. Although experimentals and controls were equally likely to have used a prescription or surgical method or condoms, mothers in the randomly assigned experimental group were actually slightly more likely to become pregnant within 18 months.

SUMMARY

In this chapter we address the second stage in the events which put a teen at risk of pregnancy--contraceptive use at first intercourse. At this point, given sexual initiation, there are two overlapping strategies to reduce the risks: 1) non-users need to become users of contraception; and 2) contraceptive users need to use an effective method consistently and correctly. In addition, given high rates of sexually transmitted infections among teenagers, measures need to be taken to protect against sexually transmitted infections.

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[12] Coordinated can be defined as governor's office coordination of a multi-agency effort or governor's office designation (such as the health department) to coordinate a multi-agency effort.

First, we considered the trends in and the correlates of contraceptive use at first intercourse. Concern about AIDS seems to have contributed to an increase in contraceptive use at first intercourse, particularly condom use, among teens from varied backgrounds. Several factors have been shown to be related to contraceptive use at first intercourse. These include living in an intact family, having a better educated mother and having discussed birth control with the partner prior to first intercourse. Teens who engage in other risky behaviors are less likely to use contraception at first intercourse than teens who avoid unconventional activities such as drug use, and who are engaged in more conventional activities, such as schoolwork. Teens who are older at first intercourse are more likely to use contraception at first intercourse than younger teens, while blacks and Hispanics are less likely to use contraception at first intercourse than whites. Neighborhood context appears to have an effect as well, with a higher proportion of women who are divorced predicting a lower likelihood of contraceptive use and better labor force opportunities for women predicting a greater likelihood of contraceptive use. The role of public policies seems modest, at least in part because the primary method used at first intercourse--condoms--is available outside of medical settings.

Although consistent effects of sex education have not been found, it is clear that considerable misinformation exists, both about the risks of pregnancy and the safety and effectiveness of contraception. Furthermore, many teens underestimate the probability of pregnancy. The data do make it clear that few teenagers actively want pregnancy when they first have sex, but it is also clear that ambivalence and unconcern characterize a sizable sub-group of adolescents. An additional impediment to going to a clinic to obtain contraception may be fear of discovery by parents.

Overall, many gaps exist in our understanding of why teens use or do not use contraception at first intercourse. The precise roles of peers, partners, siblings, parents and the media in affecting contraceptive use are not well understood. Teens are often exposed to sexual innuendo and depictions of sexual activity, but rarely is any reference made to contraceptive use, the risk of pregnancy, or sexually transmitted infections. In addition, research on Norplant®, the female condom and Depo-Provera® is lacking as yet.

In the second half of this chapter, we considered the correlates of current contraceptive use. There are many similarities between the predictors of contraceptive use at first sex and current contraceptive use. Older teens are better contraceptors, while teens who engage in varied forms of risk-taking are less effective contraceptors. Differences are also notable. For example, methods requiring male involvement are more common at first intercourse, but over time couples switch from condoms and withdrawal to female methods, particularly the pill. While blacks are less likely to use contraception at first intercourse than whites, there is little difference in current use. Not surprisingly, stronger preferences to avoid pregnancy are associated with more contraceptive use, as are more positive feelings about contraception in general and specific methods in particular. Males with more egalitarian gender role attitudes also have been found to be better contraceptors. Although communication with their partner about sex prior to intercourse is not related to contraceptive use, communication about contraception has been found to be related. Among males, AIDS education, resistance skills training and birth control education were found to predict better condom use.

Given the importance of the opportunity costs perspective which postulates that teens who have little to lose due to a birth will be less motivated to avoid pregnancy, in discussions of adolescent parenthood, it is surprising that there is so little work examining the effect of socioeconomic opportunities on contraceptive use. Recent work has not found AFDC benefit levels or family planning benefit levels associated with state pregnancy rates, the only proxy measure of contraceptive use available at the state level. However, states with a coordinated pregnancy prevention program in 1985 were found to have lower pregnancy rates in 1988, net of other variables. In addition, teen females living in states with restrictive policies regarding contraceptive licensing, advertising and selling, have been found to have higher pregnancy rates, over and above the effect of family background.

While recent work on teenage males has greatly expanded our understanding of the factors that lead to contraceptive use, future work needs to examine how communication and negotiation among couples affects the initiation and continuation of effective contraceptive use.

IV. PREGNANCY AND PREGNANCY RESOLUTION

PREGNANCY

Pregnancy Trends

The earlier discussion of trends in sexual behavior and contraceptive use logically leads into a consideration of trends in pregnancy rates. However, in describing trends in pregnancy rates, we note that explaining pregnancy is somewhat different than explaining sexual activity or contraceptive use. Pregnancy is not a behavior, but rather a consequence of behaviors--sexual activity in the absence of effective contraception. Therefore, pregnancy trends must be interpreted in the context of changes in sexual activity, age at marriage, the practice of effective contraception and pregnancy intentions.

Pregnancy rates[13] among all young women have increased somewhat over the past two decades; this increase appears to be due to increases in sexual activity. In Figure IV-A, we see that among females aged 15 to 19, the pregnancy rate (pregnancies per 1,000 females in age group) increased from 95 in 1972 to 117 in 1990 [the most recent year available]. Among females age 14

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[13] Pregnancies are under-estimated in all surveys because abortion is under-reported (Bachrach and Baldwin, 1991); this is particularly common among younger, unmarried and black respondents (Jones and Forrest, 1992). Therefore, analyses of individual-level survey data must be regarded with caution. Aggregate-level pregnancy data are constructed by combining program data from providers of abortions with birth records. Because miscarriages are also under-reported and we cannot determine the exact number of miscarriages, they are estimated as 20% of all live births and 10% of abortions according to a model developed by C. Tietze and J. Bongaarts of the Population Council. Pregnancies are calculated as the sum of births, abortions, and miscarriages, and pregnancy rates are calculated by dividing pregnancies by the number of females in the specific age group according to the following formula:

$$\text{Pregnancy Rate} = \frac{\text{\# of Births} + \text{\# of Abortions} + 0.20\ (\text{\# of Births})) + 0.10(\text{\# of Abortions})}{\text{\# of females in age group}}$$

These aggregate-level pregnancy data contain minimal information about the socioeconomic characteristics of the mother. Therefore, further breakdown of pregnancies by subgroup are not available.

and under,[14] the pregnancy rate rose from 13.5 in 1973 [1972 not available] to 17.5 in 1990; among females aged 15 to 17 the rate rose from 64.1 in 1972 to 74.3 in 1990; and among females aged 18 to 19 from 143.1 to 172.6 (Henshaw, 1994). As discussed in chapter II, sexual activity among young women also increased during this period. To take this change in the size of the population at risk of pregnancy into account we also present pregnancy rates calculated among sexually active teens. This adjustment indicates that pregnancy rates among those who have ever had sexual intercourse declined by 19 percent between 1972 and 1990 from 254 to 207 pregnancies per 1,000 sexually active females aged 15-19..

As teen females have increasingly become sexually active at earlier ages, they have, at the same time, been delaying the age at which they marry. Together, these trends have increased the period of time during which young females are at risk of premarital pregnancy. In 1970, the median age at first marriage among women was 20.8 years of age, but by 1993 it has climbed to 24.5 years of age (Saluter, 1994). Given present trends in sexual activity and marriage, there is an average of seven years between first intercourse and first marriage for females, and 10 years for males (Forrest, 1993). During this period of time between first intercourse and marriage, the majority of teen women do not want to become pregnant, but preventing unintended pregnancy requires either a return to abstinence or consistent use of an effective method of contraception for many years.

The proportion of teen pregnancies which are unintended has increased in recent years, probably at least in part due to the fact that fewer women wish to marry and have children in their late teens and early twenties. As shown in Figure IV-B, the proportion of pregnancies to teen females under age 20 that are intended declined from 22 percent in 1982 to 18 percent in 1987 to 16 percent in 1990. Thus, the vast majority (84 percent) of pregnancies to females under age 20 were unintended in 1990. Among unmarried women under age 20, the proportion of pregnancies which were unintended is even higher -- 88 percent in 1987 (Figure IV-C).

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[14] Pregnancy rates among females age 14 and under are calculated using the number of pregnancies to females age 14 and younger as the numerator, but the denominator is females age 14, according to a convention established by the Alan Guttmacher Institute. Although this differs from the procedure used by National Center for Health Statistics to calculate birth rates for females age 14 and under, estimating the rate based on a denominator of females age 14 elevates rates of pregnancy and is therefore considered a scientifically conservative procedure.

PREGNANCY RESOLUTION

Once unintentionally pregnant, an unmarried female is faced with several difficult decisions: whether to terminate the pregnancy through abortion; to carry the fetus to term and relinquish the baby for adoption; to bear the child and become a single parent; or to marry the child's father and jointly parent the child. Because these choices have important implications for their own and their offspring's futures, there is intense interest in the factors that shape how young unmarried women resolve their pregnancies.

It is difficult for researchers to realistically portray in empirical studies the complex nature of the many factors that influence a pregnant teens' decisions. First, although the alternatives described above are theoretically the choices available to all pregnant teens, psychological, sociological, economic and cultural factors may act as barriers making any number of their options untenable for particular women. Second, the pregnancy resolution decision-making process is multi-faceted, and different aspects of the decision are interrelated. Thus, for example, it is impossible to detect on the basis of their ultimate decisions whether teens choose to have an abortion because they are not getting married, or they marry because they decide to have the baby, or they decide to have the baby because they plan to get married. Third, teens who are unintentionally pregnant are not necessarily rational actors. Adolescents faced with unintended pregnancies are often characterized by conflict, doubt and ambivalence (Farber, 1991). In their longitudinal work on teenage motherhood, Furstenberg and colleagues (1987) found that teenagers were initially unhappy about their pregnancies, but by the time the children were born the teen and their families looked forward to the birth. Luker (1991) points out that this indecisiveness about wanting a child is itself a critical finding, and that disadvantaged girls drift into pregnancy and childbearing. Interviews with pregnant teens have revealed that many postpone confirming their pregnancies out of denial or avoidance (Weinman et al., 1989). Putting off pregnancy testing has potentially negative consequences because later abortions are more risky for adolescents and because late prenatal care is associated with higher risk births and poorer infant health. In addition to personal and emotional costs, poor pregnancy outcomes resulting from inadequate or late prenatal care may place significant financial burdens on society (Public Health Service, 1990). Fourth, other individuals in the adolescent's life also play a role in pregnancy resolution decision-making. Families, partners, peers, neighborhoods and communities all impose conflicting demands based on divergent values and expectations.

Although very small in scale, a descriptive study conducted by Farber (1991) illuminates the complexity of the issue. She conducted in-depth interviews with 28 black and white unmarried adolescent mothers from a variety of socioeconomic backgrounds about their pregnancy resolution decisions. Her participants were young women ages 15 to 20 living in Chicago and referred to her by agencies that provide services to teens. The sample included young women in middle-, working- and lower-class families. Farber's intensive interviews documented that adolescents are "motivated by psychoemotional needs of many kinds, impulse, explicit and implicit moral and ethical considerations, reasoned judgment, family expectations and desires and medical and other circumstances beyond their control, among other factors, in various combinations which sometimes were in conflict with one another" (p. 714).

Beyond accounting for the complexity of the decision-making process, another key limitation of most research on pregnancy resolution is that it does not begin with the process that selects women into unintended, unmarried pregnancy in the first place. Teen pregnancy is not a random process, but occurs disproportionately among teens from socioeconomically disadvantaged backgrounds. For example, as shown in Figure IV-D, 83 percent of females aged 15 to 19 who become parents are considered poor or low income compared to 38 percent of all females aged 15 to 19. Consequently, the factors that influence pregnancy resolution may be related to those that influenced her to become unintentionally pregnant. Few studies take this selectivity into account. Most research examining the factors that differentiate teens who terminate a pregnancy, those who carry to term and parent, and those who place infants for adoption use one of two approaches (see Farber, 1991). The first approach compares selected demographic and personal characteristics of teens who choose different resolution alternatives; the second compares pregnant or parenting teens to other nonpregnant or nonchildbearing adolescents. Recent research by Plotnick (1992) and Serrato (1990), both using data from the NLSY, are exemplars of studies that statistically model the two-stage process of 1) becoming pregnant and 2) resolving the pregnancy. The results of these studies are discussed in the following sections on the correlates and antecedents of pregnancy resolution.

Before reviewing the current literature about the correlates of specific pregnancy resolution options, we present data on trends in abortion, adoption and marriage. Unfortunately, data on miscarriages are not available, and we know little about the circumstances under which they occur. Therefore, this chapter will focus on the remaining outcomes as possible pregnancy resolutions.

TRENDS IN ABORTION, ADOPTION and MARRIAGE

Abortion

Abortion has been an alternative for resolving unintended pregnancies for centuries, but it was only with the legalization of abortion in the United States--the 1973 Supreme Court decision (Roe v. Wade)--that it became possible to collect data on the incidence of abortion with any accuracy. While it is generally believed that the legalization of abortion increased the use of abortion, a lack of historical data on the incidence of abortion makes it difficult to know with certainty. Nevertheless, the incidence of abortion has been influenced by contextual variables such as funding for abortion, restrictiveness of abortion laws and availability and accessibility of abortion providers (Hayes, 1987; Moore et al., 1994). Trends in abortion must therefore be considered in light of changes that have occurred in the political and social environment.

The overall teen abortion rate increased during the 1970s, presumably influenced by both the legalization of abortion and increasing levels of sexual activity and pregnancy. In the 1980s, among all females aged 15 to 19, the teen abortion rate (number of abortions per 1,000 females in age group) stayed stable, while rates actually declined among sexually experienced teens during the same period (Figure IV-E). Rates among all females age 14 and under[15] were 5.6 in 1973, 8.4 in 1980 and 7.9 in 1990; among females aged 15 to 17, rates were 15.7 in 1972, 30.2 in 1980 and 26.6 in 1990; and among females aged 18 to 19, rates were 24.4 in 1972, 60.5 in 1980 and 58.8 in 1990. This recent decline may reflect in part more restrictive laws and decreases in abortion funding during this period. When the rate is computed only among females aged 15 to 19 who have ever had intercourse, the data indicate that the abortion rate declined 24 percent between 1980 and 1990 -- from 95 per 1000 in 1980 to 72 per 1000 in 1990.[16]

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[15] Rates are based on a denominator of females age 14. For a broader discussion of the reasons for this see footnote 14.

Births

Teen birth rates (number of births per 1,000 females in age group) are influenced by numerous factors, including levels of sexual activity, abortion and pregnancy intentions. In some cases these influences work in opposite directions. For example, assuming that the miscarriage rate stays the same, if pregnancy rates remain stable, declining abortion rates might result in increased birth rates;[17] however, increases in early sexual activity without corresponding increases in contraceptive use may increase the incidence of pregnancy and raise birth rates. Moreover, as age at marriage is delayed among young women, we might expect a decline in birth rates. Trends in birth rates over the past decade reflect these countervailing forces. After declining for more than a decade, teen birth rates began to increase in 1986 (Figure IV-E). Birth rates had been fairly stable in the first half of the 1980s, although there was a slow decline in the birth rate among sexually active teens. In the mid-1980s and into 1991, however, the birth rate increased annually. Even tabulated only among sexually active females aged 15 to 19, the teen birth rate increased in the late 1980s (Alan Guttmacher Institute, 1994). Nevertheless, despite recent rises, the birth rate among sexually experienced teen females was still 35 percent lower in 1990 than the rate in 1972. Since pregnancy rates among sexually experienced teen females were stable or declined in the last half of the 1980s and abortion rates were declining, while birth rates among teens were increasing, indications are that teens were more likely to carry their pregnancies to term. The shift in resolution of pregnancy from abortion to birth is shown in Figure IV-F. In 1972, 76 percent of pregnancies (not including miscarriages, therefore number of pregnancies is equal to the sum of live births and abortions) ended in birth, but by 1980 this proportion had declined to 55 percent. Abortion remained at about the same level through most of the 1980s, but then decreased somewhat in 1989 and 1990. By 1990, 60 percent of all teen pregnancies ended in birth.

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[16] As noted earlier, abortion is highly under-reported in survey data, however, these data are collected by the Alan Guttmacher Institute directly from abortion providers and the data are considered to be quite good.

[17] Pregnancy, birth and abortion rates all refer to the number of pregnancies (births, abortions) per 1,000 females in the age group. We do not know the actual level of miscarriages and these are assumed to remain at a constant rate. They are estimated as a constant proportion (20% of births and 10% of abortions) according to a model developed by C. Tietze and J. Bongaarts of the Population Council. Therefore, since pregnancies are calculated as the sum of live births, abortions and estimated miscarriages, if the pregnancy rate remains the same but the abortion rate goes down this can only by due to an increase in the birth rate.

A comprehensive understanding of trends in birth rates should also take into account changes in pregnancy intentions. As noted in the section of pregnancy trends, the proportion of pregnancies that are unintended has increased in recent years -- in 1990 data 84 percent of all pregnancies (Figure IV-B). Despite this rise, however, the propensity to abort declined slightly during the same period. As shown in Table IV-1, among unintended pregnancies, the proportion ending in abortion declined from 53 percent in 1982 to 49 percent in 1990. Nevertheless, unintended pregnancies continue to be more likely to end in abortion and less likely to end in birth than intended pregnancies. In 1990, among unintended pregnancies, a smaller proportion ended in birth (51 percent) compared to the proportion ending in birth among all pregnancies (60 percent).

Consequently, not only has the proportion of pregnancies to teens ending in birth increased, but the proportion of pregnancies ending in unintended birth has increased. The percent of pregnancies ending in unintended birth rose from 37 percent in 1982 to 43 percent in 1988.

Adoption

Among never-married women, adoption was not commonly chosen even 20 years ago, but the proportion of babies placed for adoption has declined to even lower levels in the 1970s and 1980s (Bachrach et al., 1992). Although it is popularly assumed that the legalization of abortion precipitated the decline in adoption as a pregnancy resolution among teens, the declining trend was already occurring even before Roe v. Wade was decided in 1973 (Resnick, 1992). Resnick argues that in addition to greater societal acceptability of teen births in recent decades, changes in the professional training and socialization of health professionals, service providers and educators who provide information to teens about pregnancy options also account for a lower incidence of adoption as a pregnancy resolution decision. Findings from a 1986 study (Mech, 1986) suggest that many professionals working with pregnant teens do not present adoption as an option, due in part to the perception that teens would not consider it anyway.

Figure IV-G, shows that during the period from 1965 to 1972 among whites, on average, about one-fifth of babies born to all never-married women were given up for adoption in 1965-1972. But, by 1982 to 1988, only three percent of babies born to white never-married women were given up for adoption. Over the past few decades black women have chosen formal adoption less often than whites.

Marriage

A trend that has attracted considerable attention, even more than the increasing teen birth rates, is the increasing proportion of teen births that occur outside of marriage. Furstenberg (1991) argues that part of the reason for the concern over teen pregnancy is the fact that the traditional response to premarital pregnancy--marriage before the birth of the child--has become less normative.

The stigma associated with birth outside of marriage has notably decreased in recent years (Pagnini and Rindfuss, 1993). Moreover, high unemployment, particularly among black males, has diminished the attractiveness of young men as marriage partners (Wilson, 1987; Lichter et al., 1992). Also, the availability of abortion may cause men to feel less responsible and less willing to marry the mother of their child because abortion is an alternative.

It is important to point out that increasing rates of non-marital childbearing[18] are found among women of all ages, not just teens (Miller and Curtis, 1995; NCHS, 1994). Nevertheless, teen non-marital childbearing is a concern to social service providers, policy makers and the public because these young women often have little education and lack the ability to support their families economically, especially as a single parent. It is also a concern because raising a child is taxing, time consuming, and an emotionally draining task, even for married adults, let alone a single adolescent.

Since 1960, there has been a rapid, but consistent increase in the proportion of births to teens that occur outside of marriage, but the increase has been largest among whites. Overall, the proportion of births to females under age 20 that are non-marital[19] has increased from 15 percent in 1960 to 71 percent in 1992 (Figure IV-H). This increase has occurred most dramatically among whites -- from 18 percent in 1970 to 61 percent in 1992 (Figure IV-I). However, non-marital childbearing has been consistently high among blacks.

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[18] For the purposes of this report the term "non-marital childbearing" is defined as childbearing outside of marriage.

[19] For the purposes of this report the term "non-marital birth" is defined as a birth which occurs outside of marriage, regardless of whether the female is never married or has been previously married.

Overall, among all race and ethnicity groups, the majority of teen births in 1990 were non-marital (Figure IV-J). The highest proportion was among non-Hispanic blacks (93 percent), followed by Hispanics (60 percent); among non-Hispanic whites, 56 percent of teen births were non-marital.

The increase in non-marital births is not only due to fewer pregnant teens getting married, but also to a decreasing proportion of marital births to teens, as fewer teens are getting married, then becoming pregnant and having a child. Figure IV-K shows that among females aged 15 to 17 at first birth, the proportion of births that were marital (conceived within marriage) decreased dramatically from 41 percent in 1960-64 to eight percent in 1985-89. The proportion of births that occurred within marriage, but were conceived outside of marriage also decreased, but not as sharply -- from 26 percent in 1960-64, to 11 percent in 1985-89. Among teen females aged 18 to 19 at first birth, non-marital childbearing is less common, but by 1985-89 non-marital births still accounted for 59 percent of all births. Among these older teens, marital childbearing also declined, from 62 percent in 1960-64 to 23 percent in 1985-89. The propensity to get married after a non-marital conception did not show as ~~much~~ change, however. This suggests that a portion of the increase in non-marital births is due to delays in age of first marriage which put more women at risk of non-marital birth.

CORRELATES AND ANTECEDENTS OF ABORTION

Individual Factors

A small-scale study by Marsiglio and Menaghan (1990) provides some insight into the characteristics of young teens who would resolve a hypothetical pregnancy with abortion. Anonymous in-school surveys were completed by 577 males and females aged 15 to 18 in 1985 (70 percent were between 15 to 16 years of age) from high schools in a large, Midwestern city. They found, like previous researchers (see Hayes, 1987) that whites and those with more highly educated parents were more likely to choose abortion. Moore and Stief (1991) found black youth aged 18 to 22 in the 1987 National Survey of Children (NSC) to be slightly, but uniformly, less likely to feel "It's all right to have an abortion" under a variety of circumstances, including rape, young age and not being married. These studies echo a reality in which, given unintended pregnancy, low income and other socioeconomic disadvantaged minority teens are less likely to obtain an abortion. Data indicate that among females aged 15 to 19, 70 percent of those from higher income families (200 percent of poverty or above) obtain abortions, compared with 54 percent of low income (100 to 199 percent of poverty) and 39 percent of teens in poverty (Donovan, 1995). Also, nearly 60 percent of white teens with unintended pregnancies obtain abortions, compared with less than 50 percent of black and Hispanic teens (Alan Guttmacher Institute, 1994).

Research conducted in the 1980s provides evidence that young women who choose abortion are characterized by a more internal locus of control; higher educational aspirations, motivation and attainment; better performance in school; greater skill in thinking about hypothetical situations and more favorable attitudes about abortion (Brazzell and Acock, 1988; Chilman, 1988; Blum and Resnick, 1982; Yamaguchi and Kandell, 1987).

Brazzell and Acock (1988) interviewed 129 sexually active females under the age of 20 who were receiving services from three family planning clinics in South Central Indiana in 1979. The aim of their study was to examine how the young woman would resolve a hypothetical pregnancy. These researchers found that general attitudes about abortion were the strongest predictor of intentions regarding abortion. Abortion attitudes also mediated the effects of other variables such as perceived attitudes of the mother and best friend, and adult aspirations.

More recently, Plotnick (1992) used national-level data to examine the factors associated with first premarital pregnancies and how those pregnancies were resolved. He used a sample of 1,142 non-Hispanic white women from the National Longitudinal Surveys of Youth (NLSY), who were ages 14 to 16 in 1979. Using data from annual follow-ups he studied premarital pregnancies during the teen years.[20] Recognizing that the process leading to a premarital birth consists of two major stages--becoming pregnant and the resolution of pregnancy--Plotnick examined the impact of attitudes and related personality characteristics using a statistical technique (two-stage nested logit) that allows the researcher to estimate the decision stages sequentially. Plotnick found that the higher a woman's educational expectations, the greater the likelihood she resolved an actual unintended pregnancy with abortion. However, having a positive attitude toward school was not significantly related to abortion, nor was having egalitarian attitudes significantly related to the likelihood of resolving a teen pregnancy with abortion. High self-esteem was related to a higher probability of abortion, while unlike earlier studies, having a strong internal locus of control had a negative effect on the likelihood of abortion (Plotnick, 1992).

Using data from 1,053 young women aged 17 to 21 in 1979, who had first self-reported premarital pregnancies between 1979 and 1986 in the NLSY, Serrato (1990) estimated a model in which both the decision of whether to have an abortion and the decision of whether to marry were examined. Serrato found that hourly wages were not significantly related to the likelihood of abortion, however having no recent labor market experience was negatively associated with terminating the pregnancy.

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[20] Under-reporting of pregnancy and abortion are common in survey data at the individual level; because under-reporting is most common among younger, unmarried and black respondents, results obtained for these outcomes may be biased (Jones and Forrest, 1992; Bachrach and Baldwin, 1991).

Attitudes about readiness to parent are also found to influence the pregnancy resolution decisions of teens. Torres and Forrest (1988) analyzed responses to a 1987 survey sponsored by the Alan Guttmacher Institute of roughly 2,000 abortion clinic patients of all ages[21] and found that teenagers were 32 percent more likely than women over 18 to report that they were not mature enough to raise a child as a reason for choosing abortion.

Family

The importance of teens' perceptions of how their family members would react to their decision about keeping their child is clear across repeated studies. Mothers, in particular, emerge as critical sources of influence in the way in which pregnancy resolution decisions are made. Brazzell and Acock (1988) found that perceptions of mothers' attitudes regarding abortion were strong predictors of teen females' attitudes about abortion.

Youth with more highly educated parents are more likely to choose abortion in a hypothetical scenario (Marsiglio and Menaghan, 1990). Better educated mothers positively influence their daughter's attitudes about abortion, which influences their likelihood of opting for abortion (Plotnick, 1992). Serrato (1990) also documented a statistically significant positive association between having a college-educated mother and choosing abortion. Torres and Forrest (1988) report that among abortion clinic patients who responded to a 1987 survey, teens under age 18 were 19 percent more likely than women age 18 and older to report that their parents wanted them to have an abortion. Moreover, the young teens were 39 percent more likely to report that they delayed their abortion because of fear of telling their parents or partner than older women. In a study using a nationally representative sample of more than 1,500 unmarried females younger than 18 who had received an abortion between December, 1990 and June, 1991, Henshaw and Kost (1992) report that 61 percent of the respondents said that one or both of their parents (usually the mother) knew about their abortion. Among those who did not tell their mothers, the most common reason was their desire not to disappoint her (73 percent), fear that she would be angry (55 percent) and not wanting her to know that she had had sex (32 percent). Thirty-two percent chose not to tell their mothers out of fear of being pressured to stop dating their partner. Similar proportions cited these reasons for not telling their fathers. Among the 231 respondents who reported that they told neither parent, but one or both of their parents found out about their pregnancy, 58 percent reported one or more adverse results such as an increase in parent's stress (30 percent), parents making respondent have an abortion (18 percent) and the respondent feeling uncomfortable living at home (19 percent), to more severe consequences including physical violence in the home (two percent), the respondent being beaten (one percent) and the respondent being forced to leave home (one percent).

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[21] Survey was not restricted to a specific age range.

Plotnick (1992) used a sample of non-Hispanic white females in the NLSY who experienced a premarital pregnancy during her teen years to explore several background factors which had a direct effect on abortion, not mediated by the young women's attitudes. Living with the mother only, number of siblings, being Jewish and being Catholic were related to a lower likelihood of abortion, while living with an adult female who was employed when the respondent was 14 was associated with a higher propensity to abort. Serrato's (1990) analysis of the NLSY revealed that the higher the per capita income of the respondent's family, the greater the likelihood that she chose abortion.

Peers and Partners

It would seem logical that the attitudes and preferences of the male partner would significantly affect the likelihood of abortion among pregnant teens. Evidence from research conducted in the 1980s suggested that the more distant the teen's relationship with her partner, the more likely she was to have an abortion (Chilman, 1988; Blum and Resnick, 1982; Yamaguchi and Kandell, 1987). Brazzell and Acock (1988), using a structural model with four explanatory variables, report that closeness to the sexual partner had a significant negative effect on teen females intention to abort a hypothetical pregnancy; however, this variable did not directly affect young women's attitudes about abortion.

In addition to their partners, peers are also important influences on adolescents' pregnancy decisions. Brazzell and Acock (1988) found that females' perceptions of the attitudes of a best friend was the strongest predictor of abortion intentions. Further, they showed that the effect of youths' perceptions of the attitudes of their best friends on the intention to abort a hypothetical pregnancy are mediated by the respondents' own attitudes about abortion.

Community

Few recent studies have included contextual variables in their examinations of the factors associated with choosing abortion over other pregnancy resolution alternatives among teen females. Serrato's (1990) analysis of the NLSY showed that the unemployment level in the state was not statistically related to abortion among young women.

Policy

An analysis by Moore et al. (1994) revealed that public funding for abortion at the state level predicted that a higher proportion of pregnancies to females aged 15 to 19 would end in abortion.

Micro- or individual-level analyses of the effects of policy variables on individual-level decisions also show an effect of laws and programs.

Among white females aged 14 to 16 in the 1979 NLSY and followed until 1986, Lundberg and Plotnick (1990) documented that restrictive abortion funding policies had a negative effect on the odds of abortion versus carrying the baby to term, while the availability of abortion had a positive effect. The effect of the restrictiveness of abortion laws was not statistically significant.

Serrato (1990) used data from females aged 17 to 21 in the 1979 NLSY who had premarital pregnancies by 1986 to explore the influence of public policy variables on the resolution of out-of-wedlock childbearing. He found that among white and Hispanic women, the presence of AFDC-UC (state extends AFDC benefits to single, childless pregnant women) was not significantly associated with the likelihood of abortion, but the availability of Medicaid-funded abortions was associated. For reasons that are unclear, the presence of AFDC-UC was related to a greater likelihood of abortion among black women. Parental involvement laws were negatively related to abortion as expected, but the effect was not statistically significant. Serrato also found that a greater number of high volume abortion providers in the state was positively associated with abortion.

A potentially critical policy issue for adolescents' decisions to resolve pregnancy through abortion is the effect of mandatory parental involvement prior to teenage abortion. Over half of the states in the U.S. have enacted laws calling for some form of mandatory parental involvement before a minor can secure an abortion. While the scope of these laws vary, most require parental consent or notification before a minor's pregnancy can be aborted. Opponents of parental involvement make the case that fearing parental anger or possible rejection, adolescents will be more reluctant to admit their pregnancies until it is too late to carry out an abortion safely. In a review of related literature, however, Worthington et al. (1991) argue that the evidence suggests that once they resolve their initial anger, most parents are supportive of their pregnant daughters. They suggest that parents reacted less negatively than girls anticipated even before abortion was legalized, when non-marital pregnancy carried a greater social stigma.

Blum, Resnick, and Stark (1987) conducted a comparative study of 185 youth obtaining abortions in Minnesota, a state with a parental notification statute, and Wisconsin, a state without this requirement. They found that among women under age 18, the older a woman was, the less likely she was to notify either parent, and in Minnesota, the more likely she was to use the court bypass procedure. While a slightly greater proportion of adolescent women notified both parents in Minnesota compared to Wisconsin, the difference failed to achieve statistical significance. When only one parent was notified, young women more often turned to their mothers. Based upon results from intensive interviews with the young women seeking abortions, five themes emerged as rationales for avoiding parental notification: 1) a concern that telling parents would precipitate stress and/or crisis within the family, 2) the existence of antecedent family problems such as alcoholism or family violence, 3) a concern that notification would disrupt positive family relationships, 4) no viable relationship between parents and teenager existed prior to the pregnancy, and 5) the adolescent anticipated negative sanctions from parents based on parental religious beliefs. The researchers concluded that the impact of the parental notification law on patterns of parental notification is minimal.

CORRELATES/ANTECEDENTS OF ADOPTION

The relinquishment of children for adoption is rare, and there are no government statistics on adoption. Consequently, there is relatively little research on the factors that influence the decision to release babies for adoption. Among the studies that are available, the samples used are usually small, and limited in their generalizability to the general public. Moreover, the limited sample sizes generally do not allow researchers to differentiate by race or ethnicity. Even the one recent study using data from a national survey (i.e., the NSFG) to explore antecedents to adoption (Bachrach et al., 1992) found only 66 cases out of 430 unintended premarital births among non-Hispanic white females aged 15 to 44 which were relinquished for adoption, and that was across two waves, 1982 and 1988, of a longitudinal survey.

Individual Factors

Using a sample of 177 pregnant or newly post-partum adolescents, aged 12 to 19, receiving services during 1987 to 1990 from public and private agencies providing services to young women, Donnelly and Voydanoff (1991) explored the factors associated with the decision to release for adoption. Their dependent variable was the legal disposition of the infant up to six months following the baby's birth, since young women often change their minds about placing a child for adoption. Donnelly and Voyandoff found that in comparison to teen females who keep their infants, those who released their children for adoption were more likely to be younger and white, but were no more likely to have ever married. Those who placed their babies for adoption were also more likely to have relatively favorable attitudes toward adoption, to anticipate that they would regret the commitment of raising a child, and to regard parenting as an adolescent as not being "much fun." Marsiglio and Menaghan (1990) also found that younger respondents were more likely to choose adoption over birth than older youth, according to findings from their analysis of 577 high school youth aged 15 to 18 given the task of resolving a hypothetical pregnancy.

Drawing on a sample of 430 unmarried, non-Hispanic females aged 21 or younger and residing in maternity residences sometime during May, 1988 to August 1988, Kalmuss et al. (1991) found that those who intended to place their babies for adoption were disproportionately white (92 percent) compared to those who considered placing but did not relinquish the child (66 percent) and did not consider placing (48 percent). Those who intended to place the infant up for adoption were more likely to have lived in an intact family until age 14--48 percent versus roughly 30 percent for others. Those intending to relinquish were also less likely to have received public assistance when she became pregnant (6.4 percent) than those who considered adoption (17 percent) and did not consider adoption (19 percent) and were notably more likely to aspire to college or more--72 percent, versus 62 percent and 44 percent, respectively.

The Kalmuss et al. (1991) study, along with others, suggests that, as was the case among teenagers who seek abortions, young women who opt for adoption have a clearer sense of their futures and their own prospects. Resnick et al. (1990) studied 118 teen females aged 13 to 19 who gave birth, recruited from a consortium of 17 Minneapolis/St. Paul, Minnesota metropolitan area health and social service agencies. The researchers compared two groups of young mothers, one whom they call "placers," those who relinquished their babies for adoption, and the other called "parents," those who opted for childrearing. The groups were matched on age, marital status, ethnicity, number of offspring and their ages, and primary social service agency. Resnick and colleagues found that "placers" and "parents" were statistically different according to a number of characteristics. " Placers" were more likely to have a future-oriented perspective on their own lives and to consider themselves not ready to provide the kind of home environment that they considered suitable for a baby. Significantly, more placers than parents cited the belief that a baby would interfere with their educational aspirations.

Like Resnick and his colleagues (1990), Donnelly and Voyandoff (1991) found that teen females aged 12 to 19 who released their babies for adoption were more likely to perceive that they had a number of alternatives to early childrearing, to have thought a great deal about what they would be doing at age 25, to have higher educational expectations and to believe that it is ideal for a woman to be a mother in her twenties. Interestingly, however, teens who expected pregnancy would limit their socioeconomic attainment (i.e., education and occupational success) were not more likely to release for adoption than teens who did not expect limited socioeconomic attainment.

Bachrach and her colleagues (1992) also found that adoption is most likely among non-Hispanic unmarried young women with the greatest opportunity costs of parenthood at the time of pregnancy. Being enrolled in school at the time of conception and working for pay prior to the birth were both positively related to the relative risk of relinquishing a premarital birth. Marsiglio and Menaghan (1990) found that teens who expect to have fewer children were more likely to choose adoption over childbearing.

In understanding the characteristics of teens who choose to release their children for adoption, Resnick (1992) notes that "greater similarity exists among those who select abortion and adoption than those who carry to term and parent, particularly in terms of social class, educational attainment and aspiration variables" (Resnick, 1992, pg., 300).

Family

In keeping with evidence accumulated in previous studies, the work of Donnelly and Voyandoff (1991) documents that pregnant females aged 12 to 19 who opt to relinquish their babies for adoption come from more socioeconomically advantageous backgrounds than their peers who opt to parent their babies. They found those who released their child for adoption were significantly more likely to have mothers with higher levels of education and were significantly less likely to be recipients of AFDC. There was no discernable difference across the two groups in family size.

These findings are similar to those reported by Resnick and his colleagues (1991) in their study of 177 adolescents. Resnick et al. found that those who released their babies for adoption were more likely than those who opted for child rearing to come from families with greater incomes, to live in the suburbs and to have parents who express higher educational aspirations for them. Evidence of a link between maternal education and the likelihood of placing an infant for adoption is also reported by Marsiglio and Menaghan (1990) and Bachrach et al. (1992). For example, Bachrach et al. (1992) found that unmarried non-Hispanic women whose mothers had some college education were significantly more likely than other women to place their infants for adoption.

Studies conducted in the 1990s also support the notion that the attitudes and expectations of family members strongly influence adolescents' decisions regarding adoption. Donnelly and Voyandoff (1991), for example, found that those who released their babies for adoption were significantly more likely than their peers who opted to keep their babies to report "release for adoption" in response to the question, "if your mother could decide for you right now, what do you think she would want you to do about this pregnancy?"

In a small-scale study of 125 pregnant adolescent[22] female participants in a comprehensive adolescent pregnancy program in 1983-1984, Herr (1989) documented that teens whose mothers favored adoption were more likely to choose adoption than those whose mothers were not supportive of that option.

In a study of 592 young unmarried non-Hispanic females aged 21 or younger who were residing in maternity residences, Namerow, Kalmuss and Cushman (1993) found that among the factors they considered to estimate models of pregnancy resolution choices, including sociodemographic and opportunity-structure variables, the influences of significant others were statistically significant predictors of relinquishment for adoption. The mothers', the partners' and close relatives' desires for the respondent to place the baby for adoption were all positively associated with the decision to place the infant up for adoption. The amount of child care that the respondent expected to receive from her mother was not significantly related to pregnancy resolution decision, net of personal characteristics.

Peers and Partners

The evidence in recent studies regarding the importance of the relationship with the baby's father is mixed. Donnelly and Voyandoff (1991) found that the perceived seriousness of teen females' relationships with their babies' fathers were unrelated to their pregnancy resolution decisions. Similarly, Bachrach et al. (1992) reported that neither disagreeing with partners regarding the pregnancy outcome nor a lack of knowledge about the partner's attitude achieved statistical significance in their models. However, Resnick at al. (1991) found "placers" to be significantly less likely than “parents” to report that the baby's father's preferences regarding whether they should keep or place the baby influenced their pregnancy resolution decisions.

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[22] The article did not specify the age range of the adolescents, but reported that the mean age was 16.4 years for the experimental group and 17.3 for the comparison group.

In terms of the influence of peers, Resnick et al. (1990) found that "placers" were not any more likely to have a “friend” who was adopted than those who opted to keep their babies. However, the group that opted to parent their babies were significantly more likely than those who placed their infants for adoption to have friends (and siblings) who experienced a teenage pregnancy. Further evidence of the importance of peers comes from Herr's (1989) small study of pregnant adolescents. She found that those who did not have peers who were parents were more likely to opt for adoption.

Community

Using data from 669 teen females ages 19 years or younger who enrolled in a federally funded Adolescent Family Life Care Demonstration (AFL) program in 1989, McLaughlin and Johnson (1992) estimated a model predicting the probability of relinquishment for adoption controlling for differences in client and community characteristics. They found that young females living in predominately rural areas are significantly less likely to place their child for adoption. Moreover, they found that even after controlling for whether the individual respondents’ family receives welfare, the percent of the state population receiving public assistance has an independent negative effect on the likelihood of relinquishment.

Policy

It is important to recognize the importance of the social climate in which pregnancy resolution decisions are made. Resnick (1992) argues that many professionals working with pregnant teens fail to provide information about adoption as an alternative to abortion or parenting. He attributes this omission to "the history of secrecy, shame and guilt that has surrounded the adoption process"

(Resnick, 1992, pg. 299). According to Resnick, the "climate of disregard" for adoption by some professionals is based on their belief that teens would not have considered adoption as an option anyway. Results from the study by McLaughlin and Johnson (1992) of the AFL Care Demonstration discussed above, reveal that women ages 19 and younger served by AFL projects that include adoption counseling are more likely to elect to relinquish the child, even after adjusting for client characteristics, including initial pregnancy resolution intention and community characteristics.

CORRELATES/ANTECEDENTS OF MARRIAGE

Individual Factors

As discussed previously, decisions related to carrying a pregnancy to term and parenting are related to the teen's plans regarding marriage. Given that teenage childbearing increasingly occurs outside of marriage, considerable interest exists regarding the factors that are associated with adolescents' decisions about remaining single.

Using data from roughly 3,000 white women and 4,000 black women from the NSFG and 481 white women and 391 black women from the High School and Beyond Study (HS&B), Parnell et al. (1994) predicted the probability of marriage prior to birth among women who had a non-marital conception that resulted in a live birth. NSFG data from the time period of 1955 to 1984 revealed that among white women having less than a high school education, being 15 or younger at first birth and being non-maritally pregnant in the periods 1975 to 1979 and 1980 to 1984 were negatively related to the probability of marriage, while being in an intact family at age 14, being 20 or older at first birth and residing in the south increased the likelihood of legitimating the birth. Among black women in the NSFG, growing up in an intact family had a positive effect on the likelihood of marriage, while being 15 or younger at first birth, having less than a high school education and being pregnant in the periods 1975 to 1979 and 1980 to 1984 had negative effects.

Among women in the HS&B cohort who experienced a non-marital conception between 1981 and 1984, Parnell and colleagues found that among whites, family size, living with a single parent and living with neither parent decreased the likelihood of marriage while living in the suburbs had a positive effect. Among blacks in the HS&B, being Catholic increased the probability of marriages as did the stated expectation that they would marry at age 20 or younger.

Robbins (1991) analyzed longitudinal data from a sample of all seventh grade students in a random sample of half the junior high school students in the Houston Independent School District as of March, 1971. In late 1980, 55 percent of the original sample were contacted for a follow-up study. Among the roughly 5,100 young adults interviewed, 22 percent reported that before they reached age 21 they experienced a non-marital pregnancy.

Among respondents who had a child from a non-marital adolescent pregnancy, Robbins examined the factors that predicted whether the couple married or cohabited within six months of the child's birth. She found that males were slightly less likely than females to marry or live with their partner. Blacks were more likely than whites or Hispanics to marry or live together after a child was born from a non-marital adolescent pregnancy. Neither the extent to which youth expressed a sense of control over their lives in the seventh grade, their optimism about their future prospects, nor their experience of stress in school were significantly related to marriage or cohabitation. The older the adolescent at the time of the pregnancy, the greater the likelihood that they would marry or live with their partner. Contrary to the suggestion that youths from troubled families may intentionally become pregnant in order to escape from their home situations, Robbins found that among pregnant youths, those who perceived their home lives to be unhappy were no more likely than their peers to opt for marriage or cohabitation.

Recent evidence is mixed regarding whether marriage is considered a deterrent to young females' educational aspirations. For example, Marsiglio and Menaghan (1990) found that females age 15 to 18 were less likely to opt for a dyadic commitment to resolve a hypothetical pregnancy when they perceived that doing so would limit their educational careers. In contrast, Plotnick (1992) found that higher educational expectations increased the probability of marriage among females who experienced premarital teen pregnancy in the NLSY. Serrato (1990) provided evidence that neither the real wage level of the NLSY women who opted to carry their premaritally conceived babies to term nor their recent labor market experience affected their likelihood of remaining single.

There may be gender differences in the acceptability of marriage as a pregnancy resolution alternative. Marsiglio and Menaghan (1990) studied both young women and young men and found males to be more amenable to forming a two-parent household. Plotnick (1992) found that among the unmarried pregnant teens who carried their babies to term, those with greater acceptance of non-traditional roles for women (e.g., work outside of the home) were significantly less likely to marry.

Family

As with other aspects of the pregnancy resolution decision, the decision to marry is influenced by family factors. Living with a step-father increases the likelihood of marriage before delivery among teens, while living in a mother-only family decreases the probability (Plotnick, 1992). Plotnick (1992) also found that living with an adult female who worked increased the likelihood of marriage, but mothers' education, number of siblings and being Jewish were negatively associated with marriage among unwed pregnant teens. Serrato (1990) did not find a statistically significant association between family resources and a woman's decision to marry the father of her premaritally conceived child.

Peers and Partners

Current studies, unfortunately, reveal little about the relationship between the probability of marriage given pregnancy and the characteristics of peers and partners. However, one study, by Marsiglio and Menaghan (1990), found that youth were more likely to prefer a dyadic commitment if they perceived that their "best friend would want them to live with their partner and child".

Community

Little current research has explored the link between community characteristics and the propensity for youth to marry as a precursor to birth. However, Serrato (1990) found that the race-specific female unemployment rate for the state was not significantly associated with the decision to remain single among pregnant women who carried their babies to term.

Policy

Lundberg and Plotnick (1990) found that among young white women, welfare benefits have a negative effect on the likelihood of marriage, given premarital pregnancy. Serrato (1990) explored the association between a number of public policy variables and the likelihood of remaining single among females who carried their premaritally conceived babies to term. He found that the maximum grant level of AFDC for a family of two in the woman's state of residence was positively associated with a woman's choice to remain single; however, neither living in a state that provides optional health coverage to needy children living in intact families, nor the presence of AFDC benefits to unemployed intact families were significantly associated with marriage.

SUMMARY

Recent trends in teen pregnancy and childbirth are the results of many factors. Increasing teen birth rates are not due to higher pregnancy rates among sexually active teens, but to increasing levels of sexual activity and decreasing rates of abortion. Once higher levels of sexual activity are taken into account, pregnancy rates are actually on the decline. Moreover, few teens place their babies up for adoption and the proportion who do choose adoption has declined sharply over recent decades. In addition, teens who choose to give birth are less likely to marry to "legitimate" the birth than in the past. Given that teen sexual activity has been occurring earlier, and the age at first marriage has been rising, the period of time for which a young female is "at risk" of premarital birth has become longer.

The vast majority of teen pregnancies are unintended. Once unintentionally pregnant, an unmarried female is faced with many choices of ways to resolve the pregnancy. There is considerable interest in understanding the dynamics of pregnancy resolution at the micro- or individual-level. Policy-makers, social scientists, educators and parents are concerned about the circumstances and characteristics of teens that shape the way that they ultimately resolve their pregnancies.

Studies examining the factors associated with pregnancy resolution indicate that teens who choose to abort and those who relinquish their babies for adoption are quite similar. They tend to have more highly educated mothers and higher educational aspirations for themselves than those who choose to give birth and parent the child. Not surprisingly, teens who choose abortion and adoption express greater acceptance for these alternatives than their peers, but they also perceive that their choices would be affirmed by their mothers if it were up to them to decide. These females are also more likely to be white and to come from higher income families, while those who live with a single parent are less likely to choose abortion or adoption.

Recent evidence also reinforces earlier findings that teens' decisions regarding their pregnancies are bolstered or discouraged by their families, partners, peers and social contexts. The evidence for the influence of partners is mixed. Abortion is related to more distant relationships with partners, while findings for adoption show less of an effect of partners. One recent study showed that decisions related to adoption were not significantly influenced by the preferences of the baby's father, and another study found that the perceived seriousness of the relationship made no difference. Research also suggests that teens' pregnancy resolution decisions regarding adoption, abortion and marriage are influenced by the related behaviors of their peers as well as youths' perceptions of what their friends would think about their own actions.

With respect to characteristics that differentiate women according to their pregnancy resolution choices, researchers find that those who choose adoption are more likely to be younger, expect to have fewer children and have the greatest opportunity costs of parenthood. They are less likely to have received AFDC. The strongest predictor of choosing to abort is a woman's attitude about abortion. High self-esteem is also positively related to the decision to terminate a teen pregnancy. The likelihood of marriage given pregnancy versus other alternatives (i.e., abortion or single parenthood) is lower for teens who are Jewish and those with highly educated mothers. Among those with premarital conceptions resulting in the live birth of their first child, young teens and teens with less than a high school education were less likely to marry prior to the birth. However, teen females who live in an intact family are more likely to marry prior to the birth. Among whites, living in the south and living in the suburbs are positively related to marriage among teen childbearers, while being Catholic and expecting to marry at age 20 or younger is associated with a greater likelihood of marriage for blacks.

Finally, decisions about abortion, adoption and childbearing among teens are not made in isolation. Studies show that to varying degrees, opportunity levels, norms and social programs and policies affect individual-level pregnancy resolution decisions. Public funding for abortion and the number of abortion providers in the state are positively related to the likelihood of abortion and parental involvement laws are negatively related. Although AFDC benefits are not associated with the likelihood of choosing abortion, the proportion of AFDC recipients in the state is related to a lower likelihood of relinquishing adoption and a lower likelihood of marriage.

V. STUDIES OF BIRTHS TO TEENAGERS

OVERVIEW

Many studies have been conducted using the occurrence of a birth to a teenager or a non-marital birth to a teenager as the dependent variable. In part, choosing whether or not a birth occurs to serve as the dependent variable reflects an interest among many analysts in knowing, not what affects each step in the process leading to a teenage birth, but an interest in knowing overall how the several stages (sex, contraception, abortion, adoption and marriage) are resolved in a birth. That is, the analyst may not care whether a birth is prevented because an adolescent abstains from sex, uses contraception, or obtains an abortion but simply wishes to examine whether or not an adolescent becomes a parent. More often, the decision to focus on whether or not a birth has occurred reflects a lack of data to analyze the stages leading to the event. For example, as yet we do not have data that provide information about sexual activity or contraceptive use at the state level. Consequently, macro-level analyses are necessarily focussed on rates of birth, non-marital birth and sometimes abortion. Similarly, most data bases that are collected for purposes other than the study of fertility, such as the National Education Longitudinal Study (NELS:88) and the Panel Study of Income Dynamics (PSID), do not include detailed information about the individual respondent's transition to sexual activity or use of contraception. Thus, many data bases will not support studies of anything other than the addition of a baby to a household. In addition, under-reporting of pregnancy and abortion are common at the individual level (Bachrach and Baldwin, 1991). Because this under-reporting is most common among younger, unmarried and black respondents, results obtained for these outcomes may be biased (Jones and Forrest, 1992). This concern has pushed analysts to study births instead of pregnancy as a dependent variable rather than accept possible biases in data that plague studies of pregnancy and pregnancy resolution.

The varied motivations that have led researchers to study teenage childbearing as an outcome have led to a wide variety of approaches. As in preceding sections, we organize our discussion around categories of independent variables.

Individual Factors

Age and Development

Not surprisingly, among males aged 15 to 19, older teens are more likely to have a child than younger teens (Ku et al., 1993b). Similarly, among females, birth rates (births per 1,000 females in the specified age group) are higher among older teens than younger teens. In 1992, the birth rate among females aged 18 to 19 was 94.5, compared to 37.8 among teens aged 15 to 17 and 1.4 among teens under age 15 (National Center for Health Statistics, 1994).

Recent analyses, in the U.S. and Great Britain, have shown a relationship between age at menarche and the timing of motherhood (Kahn and Anderson, 1992; Manlove, 1995a). Based on data from the National Child Development Study which follows a cohort of British teens, young females with an early age of menarche have a higher likelihood of becoming teenage mothers, whereas girls who develop later have a lower likelihood, controlling for family background factors and individual performance measures (Manlove, 1995a).

Attitudes

Wanting a child or feeling ambivalent having a child have both been found to predict having a birth. In Zabin's (1994b) study of a sample of black urban females aged 17 and younger who came to a clinic between 1985 and 1986 for a pregnancy test, only those who did not want to become pregnant and were not ambivalent about this preference had a lower probability of having a child within the next 18 months. Similarly, Abrahamse et al. (1988), examining more than 13,000 female sophomores in the 1980 High School and Beyond study, found that students willing to consider having a non-marital birth were in fact significantly more likely to have a birth during the next two years. This effect was found among high-risk girls and among blacks, whites and Hispanics. Hanson et al. (1989) report similar results for sophomore males in the High School and Beyond sample. Furthermore, in a longitudinal study of British females surveyed at birth and ages 7, 11, 16 and 23, Manlove (1993) found that females who reported an early ideal age for starting a family had a higher risk of having an early first birth, and these attitudes help explain how daughters of teenage mothers were more likely to become teenage parents themselves.

In this context, it is worth noting that despite increases in the proportion of U.S. residents age 18 and older who agree that "there is no reason why single women shouldn't have children,"[23] only 14 percent of white women and 13 percent of white men agreed that it is "acceptable for a daughter of yours to have a child outside of marriage" in 1985 compared to eight percent of both white women and men in 1974 (Pagnini and Rindfuss, 1993). While black females were more accepting than whites, only a minority of blacks agreed that it would be acceptable for their daughter to have a child outside of marriage. Among the sophomore girls in the High School and Beyond Study, 41 percent of blacks, 29 percent of Hispanics and 23 percent of non-Hispanic whites said they were willing to consider non-marital childbearing (Abrahamse et al., 1988).

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[23] Pagnini and Rindfuss (1992) report that 31 percent of white women and 34 percent of white men agreed that "there is no reason why single women shouldn't have children" in 1974. The respective figures in 1985 were 47 percent and 46 percent.

Plotnick and Butler (1991) conducted prospective analyses on non-marital birth among girls who were 14 or 15 in the initial year of the NLSY. In multivariate analyses, neither gender role attitudes, locus of control, work attitudes nor educational expectations was found to predict whether a girl had a non-marital birth before age 20. However, based on data from NELS:88 which was collected among eighth graders in 1988 with follow-ups in 1990 and 1992, Moore et al. (1995b) found that girls with higher educational aspirations in eighth grade were less likely to have had a birth four years later (the year they would be expected to graduate), compared to those who had lesser educational aspirations. Similarly, a longitudinal study of a Toronto sample of high school students first interviewed in 1976 and followed until 1986, found that youth with higher educational aspirations in 1976 were older when they became parents (Haggan and Wheaton, 1993). Sugland (1992) also found that girls aged 14 to 16 in the 1979 NLSY with aspirations to attend college and those who expect to attend college were less likely to have a birth by 1983. Also, white girls whose expectations fell below their aspirations were more likely to have a birth. This measure of disparity between aspirations and expectations did not affect childbearing among black or Hispanic adolescents.

Risk-Taking

Given that risk-taking and non-conventional behaviors have predicted a higher probability of sexual activity and a lower likelihood of contraceptive use, it is not surprising that studies of childbearing also find that teens who have engaged in varied risk-taking activities are more likely to become parents (Hanson et al., 1989; Serbin et al., 1991).

On the other hand, measures of leadership and school involvement are associated with a lower risk of non-marital birth. For example, girls who served as the officer of a school club or organization and girls who were involved in a religious organization in their school were less likely to have a non-marital birth before the time of high school graduation (Moore et al., 1995b). However, analyses by race show that being an officer had a significant negative effect on the likelihood of a non-marital birth only for black females and involvement in a school religious organization had a negative effect only for whites.

School Performance and Dropping Out

Academic problems are found to increase the probability of childbearing during the teen years. Several studies have found that girls who are behind grade in school (i.e., they are not at the grade level they would be expected to be given their age) are more likely to become mothers (Moore et al., 1995b; Zabin, 1994b). Also, girls with a more negative attitude toward school were more likely to have a non-marital teen birth (Plotnick and Butler, 1991). Sugland (1992) found that white and Hispanic high school girls in the NLSY who were not making consistent progress in school were nearly twice as likely to have a baby as girls who were enrolled and moving ahead in school each year. The reverse, surprisingly, was found for black girls, net of numerous background factors; that is, black females who were doing poorly in school were less likely to have a birth. In a study using the NELS:88 to follow girls from eighth grade to twelfth grade, Moore et al. (1995b) found that numerous measures of school performance measured in eighth grade predict the probability of a non-marital birth by the end of the high school years. Students with low grades in eighth grade, lower test scores, and those who changed schools four or more times were all more likely to have a birth by the (expected) year of graduation.

Using the NELS:88, Manlove (1995b) conducted event history analyses to examine the influence of dropping out on the timing of motherhood for school-aged teens. These analyses show that between eighth and twelfth grade, dropping out of school prior to pregnancy increases the likelihood of having a birth before the expected year of high school graduation, especially at early ages, for white and Hispanic females. There is no significant relationship between dropping out and teenage motherhood, however, for black teens, although other measures of school performance and aspirations do have a significant influence for blacks.

Race/Ethnicity

Blacks are consistently found more likely to have a birth, particularly a non-marital birth, during their teen years (Abrahamse et al., 1988; Moore et al., 1995b). In models that control for numerous social, economic and family variables, the racial difference between blacks and whites is reduced, although a residual difference generally remains (Moore et al., 1995b). However, other research finds no effect race difference in the risk of non-marital birth once other factors are accounted for. Based on data from the Panel Study of Income Dynamics (PSID) of a sample of 873 females who were age 21 or older in 1988, Haveman and Wolfe (1994) examined non-marital births between the ages of 13 and 18. They found blacks were marginally[24] more likely to have an non-marital teen birth. However, after accounting for additional family, neighborhood and policy variables, this effect is no longer even marginally significant. These findings indicate that it is other factors which are associated with being black that have a significant effect on the likelihood of non-marital teen birth.

Some researchers have explored whether the determinants of a non-marital birth are different for blacks and whites by running separate models for each race. Moore et al. (1995b) find that some factors appear to operate the same for blacks as well as whites. For example, living in an intact family and having higher grades are associated with a lower risk of non-marital birth among both blacks and whites, while being behind grade and changing school four or more times between first and eighth grade were associated with a higher probability of a birth by the expected time of high school graduation for black and white girls. Wu (1994) examined premarital births among a sample of females aged 14 to 21 in the 1979 NLSY who were followed until 1989. He found that among both blacks and whites, a higher permanent income was associated with a lower risk of a premarital birth. He also found that changes in family situation (i.e., number of divorces, separations, marriages) worked similarly for blacks and whites and were associated with an increased risk of premarital birth.

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[24] Marginally refers to a level of statistical significance of $p < 0.10$. In other words, the probability that there is no effect (i.e., the true effect does not differ from zero) is less than 10 out 100 cases. The conventional level of significance considered by social scientists to be statistically significant is $p < 0.05$ (i.e., less than five out of 100 cases).

Nevertheless, other factors work differently for whites and blacks. For example, higher test scores are associated with a lower risk of a non-marital birth for black females but the effect is not significant for white females (Moore et al., 1995b). Similarly, black females who reported that "students in school see (them) as not at all popular" were less likely to experience a non-marital birth, while this effect was not significant among whites. Wu (1994) found that variability in income was associated with a higher likelihood of a premarital birth, while among blacks variability in income was associated with a lower risk of a premarital birth. He also found that exposure to a mother-only family for 75 percent of their lives was positive and significantly associated with a premarital birth among whites. However among blacks, exposure to a mother-only family only had a significant and positive effect on risk of a premarital birth when measured at birth or measured during the first five years of life. Other researchers (Haveman and Wolfe, 1994) have tested for differences between blacks and non-blacks in predictors of non-marital childbearing and did not find the overall structure of the relationships to differ significantly.

Few studies are able to study Hispanics as a group because in most surveys, the number of Hispanics that are sampled is very small. However, Moore et al. (1995b) find that Hispanic students are more likely to have a non-marital birth than non-Hispanic white females. This effect is also reduced somewhat once family, peer and school variables are accounted for.

Peers, Siblings and Partners and Teenage Childbearing

Although only a small number of studies address the influence of peers on teen birth, some studies have shown effects. Interestingly, black females who report that "students in school see (them) as not at all popular" are less likely to have a birth (Moore et al., 1995b), net of numerous measures of school success, family influences and educational goals. Among white females this effect was not significant. At the bivariate level, youth who reported that their peers see them as "not at all" a good student were more likely to have a birth. However, once control variables were added in multivariate models, white females who reported their peers saw them as a poor student were less likely to experience a non-marital birth. This effect was not significant for blacks.

Unfortunately, we uncovered little research which addresses male partners. Hanson et al. (1989) found that male students in the tenth grade in the 1980 High School and Beyond study were less likely to become fathers before age 20 if their peers placed value on education.

Haveman and Wolfe (1994) found that a higher number of siblings was marginally associated with a greater likelihood of experiencing a non-marital teen birth among females. However, Hanson et al. (1989) found no relationship between number of siblings and whether a male reported having fathered a child during his teens.

Parents/Family Factors and Teenage Childbearing

Females raised in an intact family with both biological parents are consistently found to have a lower probability of themselves having a non-marital teen birth (Moore et al., 1995b; Wu and Martinson, 1993; McLanahan and Sandefur, 1994; Kahn and Anderson, 1992; Hill and O'Neill, 1993). In addition, males raised by a single mother have been found more likely to father a child during their teen years (Ku et al., 1993a). Haveman and Wolfe (1994) find that parental marital transitions have a particularly strong effect on teen parenthood. Among females, they estimate that the effect of a parental marital separation increases the likelihood of a non-marital birth between the ages of 13 and 18 by 100 percent. Wu (1994) also finds a strong positive association between changes in family situation and risk of a premarital birth in his sample of females in the 1979 to 1989 NLSY.

The effects of single parenthood have also been examined among daughters of women who were themselves teens when the daughter was born. Horowitz et al. (1991) followed the children born to 180 teen mothers aged 13 to 18 in New Haven, Connecticut, between 1967 and 1969. Twenty years later, their daughters were more likely to have become teen mothers themselves if their mother lived alone and was depressed. Daughters of teen mothers also have a higher probability of becoming a teen parent, even after controlling for family background, family structure and school performance (Kahn and Anderson, 1992; Manlove, 1993, 1995b).

Based on qualitative interviews with 25 adolescent mothers and focus groups, Musick (1994a) suggests that complex difficulties in the mother-daughter relationship contribute to the risk of early motherhood. She sees childbearing used by the daughter as compensation for not getting needed inputs from the mother earlier in her life, as a reflection of both wanting to do better than the mother and fearing to be different than the mother, and as a means of *rapproachment* between mother and daughter during a turbulent time. These insights are based solely on retrospective interviews with disadvantaged adolescents who became mothers; however, they are in line with other studies that suggest troubled family relationships among those teens who become parents. Maternal influences can also lead to delayed childbearing. Analyses of women 20 or older in the 1988 NSFG indicate that teenage childbearing is less common among women who recall discussing with their mother how pregnancy occurs (Kahn and Anderson, 1992).

There are mixed findings for the influence of parental involvement and aspirations on the timing of motherhood. Manlove (1995a) found that parental involvement in their child's education, even at an early age, strongly influences the timing of a first birth. In another study of NELS:88 data, Manlove (1995b) found that parental involvement in school activities significantly reduced the risk of having a school-aged birth for white and black females, while maternal post-secondary educational plans influenced the timing of births among Hispanic teens. However, the influence of parent-school factors on the timing of motherhood operated all or in part through students' educational involvement and performance. Once the teen's school involvement was accounted for, parental involvement was no longer significant for blacks or Hispanics, but among whites, the effect of parental involvement remained even after accounting for the student's own school involvement (Manlove, 1995b). Moore et al. (1995b) also found that daughters whose parents expected them to graduate from college were significantly less likely to have a non-marital birth during their high school years. However, net of their daughter's own educational expectations and numerous measures of family and school factors, the parent's educational attainment did not predict whether a non-marital birth occurred during the high school years. Kahn and Anderson (1992) found higher maternal education related to lower probability of a teen birth; however, their data base did not include a measure of family income. Haveman and Wolfe (1994) controlled for the ratio of income to poverty, but found mother's educational attainment still had an effect. They found that females whose mothers had graduated from high school were less likely to have a teen birth, but father's educational attainment had no effect. In fact, these researchers estimate that if all mothers of teenage girls had completed high school, the likelihood that their daughters would have a non-marital teen birth would decrease by nearly 50 percent.

In a clinic sample of urban, black females aged 17 and younger, girls from families that received welfare were found to have a higher probability of later becoming mothers (Zabin, 1994b). Furstenberg et al. (1990) also found that among non-black unmarried women aged 15 to 44, in the 1982 NSFG, the daughters of teen mothers who had received welfare during the daughter's teen years were more likely to become teen mothers themselves. Similarly, Hill and O'Neill (1993) found that daughters, but not sons, from families that received welfare in 1979, the first year of the NLSY when respondents were aged 14 to 21, were more likely to become unmarried parents by 1987 when they were aged 22 to 27. However, Haveman and Wolfe (1994) found that females whose family had ever received AFDC at any time during their childhood were no more likely to have had a non-marital teen birth, net of other factors, although the ratio of income to poverty did have a significant negative effect.

Community Variables

In general, indicators of a relatively advantaged community are associated with lower levels of teenage childbearing. Billy and Moore (1992), for example, found that among non-black, unmarried women age 15 to 44 in the 1982 NSFG, the median housing value in communities has a small negative effect on the risk of a non-marital birth. They view higher housing values as an indicator of the economic status of the community in which women reside, and thus interpret the correlation they find as evidence that unmarried women in advantaged communities who have more to lose by having a non-marital birth are in fact less likely to have a child than those who live in disadvantaged communities. Although not a study of teens, about 81 percent of the observed exposure to risk of a live birth among the unmarried women in the sample is due to those under 20. Therefore, the authors argue that for practical purposes the results can be interpreted as risk of a non-marital birth during adolescence. Similarly, Ku et al. (1993a) found that teenage males in the 1988 National Survey of Adolescent Males (NSAM) were more likely to have fathered a child if they lived in a community with a high unemployment rate. They also found males more like to have fathered a child if they lived in a community with a high ratio of males to females.

Duncan and Hoffman (1990) in a sample of females aged 14 to 19 in 1985, found black teenage females in the Northeast more likely to have a non-marital birth, net of numerous other factors; however, community size had no effect in their analyses. On the other hand, Hanson et al. (1989) found that, net of numerous other factors, teenage males living in the southern United States were more likely to father a child before age 20 than males from other regions. Duncan and Hoffman (1990) found regional control variables to be critical; without these controls, the effects of AFDC benefit levels were large and significant; but with these controls, effects of AFDC benefits became small and non-significant.

Moore et al. (1994) found state-level teen birth rates in 1990 to be higher in states with higher levels of female labor force participation and higher rates of violent crimes, but lower in states with better-educated populations. The proportion of the population who voted for President in 1988 was associated with a lower birth rate among whites in 1990, but a higher non-marital birth rate among young black teens.

School Effects

In addition to studies of the effect of community on teen birth, some research has examined the effect of school-level factors on teens fertility. Moore et al. (1995b) report that females in schools described as safer were less likely to have a school-aged non-marital birth. Manlove (1995b) found that school-level factors had a stronger influence on the timing of motherhood for black teens than for whites or Hispanics. Blacks who attended Catholic or other private schools were only 20 percent as likely to have a school-aged birth as black girls who attended public schools. Mayer (1991), using data from the 1980 High School and Beyond survey, found that girls in schools with high socioeconomic status students were less likely to have a birth by 12th grade, and that the effect of school socioeconomic status was stronger for girls who were themselves from families of lower socioeconomic status.

Recent research suggests that teacher encouragement may have an additional influence on the timing of motherhood. British females whose teacher expected them to continue with school past the minimum leaving age have a lower likelihood of becoming teenage parents, even after controlling for educational performance (Manlove, 1993). Black females in the U.S. who received especially low teacher ratings in eighth grade were over twice as likely to have a school-aged birth, even after controlling for educational performance, but no similar effect was found among whites (Manlove, 1995b). This suggests that teacher discouragement (or encouragement) has an especially strong influence on black females.

Policy Influences

Studies commonly find that labor market effects swamp public policy variables, with higher female wages predicting lower fertility and higher male wages predicting a lower incidence of non-marital fertility (see South and Lloyd, 1992). Duncan and Hoffman (1990) examined the relative importance of welfare benefits and economic opportunities in predicting the occurrence of a non-marital birth in a sample of black females who were observed from age 14 to 19 in the 1985 wave of the Panel Study of Income Dynamics (PSID). They found only a small and non-significant effect of AFDC benefit levels in the state of residence on the likelihood of an early non-marital birth. They contrasted this with a large and statistically significant effect of estimated economic opportunities at age 26. Similarly, Moore et al. (1993), using data from the NLSY, did not find the average level of AFDC benefits in a young woman's state of residence to predict her age at first birth. In addition, they did not find unmet need for family planning services[25] to predict age at first birth for white or black females, but among Hispanics a higher level of unmet need was associated with delayed childbearing. Plotnick (1990) and Lundberg and Plotnick (1990), using the NLSY, find the combined AFDC and food stamp benefits are associated with the probability of a non-marital birth before age 20 among whites but not blacks. In a 1994 paper also using the NLSY, Lundberg and Plotnick find welfare to have trivial effects on pregnancy and pregnancy resolution, but a greater effect on the probability of marriage. Hill and O'Neill (1993), also using NLSY data, similarly find effects of higher combined AFDC and Food Stamp benefits on having a non-marital birth and remaining unmarried until at least age 26 among white females but not black females. They also estimate models for males on the probability of fathering a child outside of marriage and find higher benefits significantly associated with non-marital fatherhood for blacks and Hispanics but not whites. In addition, males with higher potential wage rates (as estimated using data for males 20 to 44 in the Current Population Survey) were found to have a lower likelihood of fathering a child outside of marriage.

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[25] Unmet need for family planning services is defined as the percent at risk of unintended pregnancy served by family planning in a respondent's state of residence in 1979.

Moore et al. (1994) conducted analyses of state teen birth rates in 1990 as a function of numerous contextual and policy variables. In these analyses, a state-level measure of teens at risk of unintended pregnancy who were served at a clinic funded by Title X of the Public Health Service Act was found to be unrelated to state teen birth rates, net of control variables. On the other hand, a measure of overall public dollars spent on family planning in each state was found to predict lower teen birth rate in three out of four models. Specifically, funding predicted lower non-marital birth rates among young white and young black teens and a lower white teen birth rate. Overall funding was not related to the black teen birth rate, however. Although state laws restricting the availability of abortion to minors were not found to be related to teen birth rates, funding for abortion was found to predict a lower birth rate among black teens, a lower non-marital birth rate among young black teens and a lower proportion of pregnancies ending in non-marital birth. The proportion of households in a state receiving AFDC was not related to teen birth rates in any models. Larger AFDC payments in a state were marginally associated with higher rates of teen childbearing among whites and higher rates of non-marital childbearing among young white teens; however, this association only emerged when prior fertility in the state was controlled. AFDC benefit levels were not associated with any measures of fertility among black teens. Measures assessing state sex education policies and the presence of school-based clinics were unrelated to the teen birth rate, perhaps because no measure of the intensity of effort was available.

Haveman, Wolfe and Peterson (1995) examined data for 873 girls in the Panel Study of Income Dynamics (PSID) who were 1 to 6 years of age in 1968 and were followed for the next 21 years. Multivariate models were estimated predicting whether a female had a non-marital birth before age 19. Models included control variables for race, family structure, education, religiosity mother's age at first birth and poverty. Three variables measuring the policy environment were also included, specifically, a measure of the average adult unemployment rate in the neighborhood of residence at ages 6 to 15; the average real maximum state welfare benefit level in the state of residence at ages 15 to 18; and the average real public per capita family planning expenditures in the state of residence at ages 13 to 19. Net of control variables, the welfare benefit level was not found to be associated with the probability of an early non-marital birth. However, higher unemployment and lower expenditures for family planning were both significantly related to an elevated risk of a non-marital birth before age 19.

Haveman and Wolfe (1994) estimated a model to predict whether a female had experienced a non-marital birth between ages 13 and 18. They found no effect of the maximum welfare benefits in the state on the likelihood of experiencing a non-marital teen birth, although the ratio of income to poverty did have a significant negative effect. In a second model controlling for selection into non-marital motherhood,[26] neither welfare benefits, nor whether the females family had ever received welfare had a significant effect of the likelihood of receiving welfare after her non-marital teen birth.

South and Lloyd (1992) find, contrary to economic theory, that higher benefits were associated with lower non-marital teenage fertility (and no association between AFDC benefits and non-marital fertility among older women.) However, they find higher payments associated with a higher ratio of non-marital teen births to all teen births. Higher median incomes for full-time year-round female workers were related to lower teen non-marital birth rates; higher male incomes were associated with higher non-marital teen birth rates, while higher levels of male non-employment (i.e., either unemployed or out of the labor force) predicted lower rates.

Clarke and Strauss (1994) also select fixed effects models with both time and state dummy variables as the most appropriate model. They examine the teen non-marital birth rate for the years 1980 to 1989. They also find higher AFDC benefit levels are related to a higher non-marital teen birth rate, while the percent of counties with an abortion provider, hourly wages and female unemployment are negatively associated with non-marital childbearing. The authors note that increasing wages at the low end of the income distribution may reduce non-marital childbearing, as may lowering welfare benefit levels.

Meier and McFarlane (1994) also estimate models including state-specific dummy variables. They find per capita income has a positive association with the state teen birth rate, while the percent of the population in counties with abortion facilities, the rate of publicly-funded abortions and the percent of females in the labor force, have a negative association with the state teen birth rate. AFDC benefit levels were not included in these models.

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[26] Selectivity is an issue because it can cause biased results. Selectivity refers to the fact that early non-marital birth is not a random process. For example, non-marital teen births occur disproportionately among disadvantaged teens. Therefore, if models are estimated on a selective subgroup (i.e., those experiencing a non-marital teen birth) without controlling for factors (both observable and non-observable) which select them into that group, the results may be biased. To account for selectivity a procedure such as that used by Haveman and Wolfe (1994) should be used.

Moore et al. (1995b) find that girls who attended a sex education class once a week or more often during eighth grade are more likely to have a school-aged non-marital birth; however, this effect is statistically significant only among blacks. Manlove (1995b) also investigated the effects of attending sex education classes and finds them to be associated with an increased likelihood of having a school-aged birth for black teens but a lower likelihood of a birth for Hispanics. These results may be due to the types of school programs targeted to at-risk black teens.

Labor market opportunities have been argued to have strong influences on teen childbearing. The Youth Incentive Entitlement Pilot Project (YIEPP) was initiated in the late 1970s to increase the economic opportunities of youth in four study areas: Denver, Cincinnati, Baltimore and selected rural Mississippi counties. Phoenix, Louisville, Cleveland and other rural Mississippi counties served as control sites for this experimental study. Interviews were conducted in 7,510 households containing youth eligible for YIEPP. Olsen and Farkas (1990) analyzed data for 2,387 black teen females aged 14 to 19 in 1978. They find greater employment opportunity to have a strong negative effect on non-marital childbearing, controlling for age. This important study suggests that exogenous introduction of labor market opportunities could lower levels of teenage non-marital childbearing.

SUMMARY

Studies of the factors associated with the occurrence of a birth indicate that older teens, teens who want or are ambivalent about pregnancy, teens who accept the possibility of non-marital childbearing for themselves, black teens, young females who engage in other forms of risk-taking, those who changed schools frequently and those whose families received welfare were more likely to have a birth. Teens with higher educational aspirations, those who are more successful academically, those who hold leadership positions in extracurricular activities, those whose parents have higher education expectations for them and teens from intact families are less likely to have a teen birth. Studies examining the effect of larger welfare benefits on teen fertility at the individual or at the state level have produced inconsistent results. Some studies find no association, while others report a statistically significant association between more generous benefits and early, and especially, non-marital childbearing. However, better employment opportunities have consistently been found to be associated with a lower probability of birth. In fact, labor market variables may even be more important than public policy variables. In general, teens from more advantaged communities are less likely to have a birth. Finally, measures of overall funding for family planning services are associated with lower state-level birth rates in several studies.

VI. RESEARCH PRIORITIES

CRITICAL RESEARCH QUESTIONS

The transition to first sexual intercourse among adolescents is poorly understood. Data indicating that such transitions are frequently non-voluntary have altered the perception of this event, but this information represents only the first step. The factors that enter into a decision to become sexually active are not well researched. In particular, prospective analyses examining the relative roles of peers, partner, siblings, parents, media, neighborhood influences, biological development and public policy and programs as they affect the timing of first sexual intercourse are needed. Such analyses can be conducted on many of the national data bases described above. In particular, analyses need to be conducted among adolescents in low-income families. Increasing the low-income samples in current surveys might be considered; alternatively, questions asked in these large-scale surveys could be replicated in studies conducted among at-risk, low-income populations in the context of evaluations of welfare reform.

Ways to operationalize and empirically examine the opportunity cost hypothesis are needed. While it is widely believed that a lack of future opportunities, or an adolescent's perception of inadequate future opportunities, is a major reason adolescents do not delay sex or practice contraception, it has proved to be very difficult to test this hypothesis. The development and addition of measures of actual and perceived opportunities to new data resources would permit such analyses. In addition, macro-level analyses (e.g., analyses which use the state, city, or county as the unit of analysis) of communities experiencing improving labor market opportunities versus declining labor market opportunities would inform current discussions. Such analyses could be based on youth experiencing naturally occurring economic change or they could be lodged within evaluations of job training and empowerment programs and enterprise zones.

In general, policy and contextual variables need to be added to existing data collection efforts so that studies of individual, family and peer influences can also include measures of important program and legal issues. For example, measures of child support policy in the state or community of residence, family planning availability, welfare benefit levels, abortion policy and local labor market opportunities could be appended to data files to support analyses of the independent and interactive influences of these factors on adolescent sexual and contraceptive behavior, and on pregnancy resolution decisions.

Studies of the factors related to the decision to relinquish a child for adoption are also needed. At present, information is lacking even on the number of children placed for adoption; information on the factors leading to adoption is very thin.

Similarly, studies of the decision to marry are few and inadequate. It is known that many of the men who father children to teenagers are themselves much older than the mothers, with two-thirds being age 20 or older, but little information is available on other characteristics of these men, including their educational and economic circumstances, future prospects, attitudes and preferences. With increases in the number of studies that provide information about men, there is a need to incorporate additional information about partners and then include these variables in multivariate analyses of decisions about marriage and pregnancy resolution more generally.

In general, little is understood of partner dynamics; that is, the relationship and interaction between partners. Most studies include data from the perspective of one individual only. How individuals interact in decisions about sex, contraception and pregnancy resolution requires longitudinal data from both partners. The field is not ready to mount a large-scale study of this issue at present, but small-scale intensive interviews would be warranted for the purposes of developing hypotheses and measures to use in future studies.

The actual use of methods of contraception by adolescents is only beginning to be understood. At present it is clear that many adolescents fail to use their method correctly and consistently, but even descriptive data for a national sample is lacking. Research is needed on the individual and couple factors leading to correct and continuous use. In addition, qualitative and intensive work is needed to confirm that current research employs the full range of constructs and measures them with both statistical and cultural sensitivity. Also, research is needed on new methods of contraception, including Norplant®, the female condom and Depo-Provera®, and on the use of methods (or dual method use) to prevent sexually transmitted infections as well as pregnancy.

Finally, a richer understanding is needed with regard to pregnancy intention. While it is known that very few teenagers actively wish to become parents as adolescents, the intensity of this wish varies. In addition, some teens feel competing motivations regarding sex, pregnancy, contraception and marriage that are poorly understood. Qualitative work designed to identify the factors entering into the thought and emotional processes of adolescents in different social classes and race/ethnicity groups is needed, both to enhance our understanding of the kinds of factors that matter to teens and to develop new measures of intention.

DATA

Several major new data resources will become available for analysis within the next two years and high priority should be given to rigorous analysis of these nationally representative, longitudinal data bases. A coordinated program of research developed and sponsored jointly across several government agencies could be highly fruitful. The most important data resources that will be available soon are described below.

The 1995 National Survey of Family Growth (NSFG) is now in the field. Because data collection is computer assisted, data should become available for analysis much sooner than has been true in the past. The data collected in this survey have been significantly expanded with the addition of life event information. This event history information will support causal analyses of how experiences in varied domains of life (e.g., education, family, residence) relate to fertility. In addition, it will support much more precise estimates of the causal ordering of events, both because detailed data are being collected using a calendar format and because a longitudinal follow-up is being planned for two years after the initial survey. The National Center for Health Statistics, sponsor of the survey, lacks adequate financial resources to rapidly and fully analyze these data. The National Institute of Child Health and Human Development (NICHD) and the Office of Population Affairs (OPA), among others, also support this data collection effort. Collaboration across agencies would be highly fruitful.

The National Longitudinal Study of Adolescent Health (Add Health) is collecting data in schools from more than 100,000 adolescents in grades seven through twelve and collecting in-home data for 19,000 of these teenagers. Siblings in grades seven through twelve will also be interviewed, supporting further work on family and genetic influences. Detailed data on classmates can support important new work on peer influences. Parent interviews will provide information on the family environment and varied types of information will be appended to describe the school and neighborhood context. At present, only one follow-up is planned a year after the first interview. The utility of a second follow-up would be very high. Developers of the survey are committed to making the data available to the research community at the same time the data become available to them. These data, sponsored by NICHD, will be so comprehensive that they will support numerous studies of antecedents of sexual and fertility behavior.

The third important data resource is the series of surveys of males being conducted at the Urban Institute with support from NICHD and OPA. This research team has been extremely productive, but further analysis of the data focussing on pregnancy and methods other than, or in addition to, condoms would inform discussions of pregnancy prevention.

Plans are evolving to extend the 1993 panel of the Survey of Income and Program Participation (SIPP) and follow all persons in the sample for a total of ten years. The expanded survey will be called the Survey of Program Dynamics (SPD). It will provide an opportunity to examine how receipt of public transfers and participation in public programs affects the development of children, including the sexual and fertility behavior of adolescents. Since children will be followed into and through adolescence for a total of at least ten years, the long-term consequences of family economic well-being and dependency can be traced for the sexual and fertility behavior of multiple children in the same family.

A data resource that is on the horizon is the 1996 cohort of the National Longitudinal Survey of Youth (NLSY). Given the extensive information collected on education and labor force experiences in these Department of Labor surveys, this new survey represents a particularly promising resource for examining opportunity cost hypotheses. Data will also be collected from a parent. The sample will be younger than the previous NLSY sample, ages 12 to 17 rather than 14 to 21, which will provide more cases for prospective causal analyses. This sample also provides the opportunity to study very early transitions into sexual activity, a more difficult task with the NSFG because the youngest respondents are fifteen years of age. In addition, as more and more children born to women in the 1979 cohort of the National Longitudinal Survey of Youth enter their teen years, an extraordinary opportunity will exist to examine the determinants of sexual initiation, contraception use and parenthood at ages 11 to 14.

DISCUSSION

Perhaps the clearest conclusion that can be drawn across the myriad of studies examined is that the youth most at risk of becoming parents during their teen years are the youth least well-situated to raise a healthy, well-adjusted and high-achieving child. Youth from economically disadvantaged families and communities, youth with substance abuse and behavior problems, youth who are behind in school and youth who have low aspirations for their own educational attainment are more likely to initiate sexual intercourse at a young age, less likely to contracept consistently and more likely to bear a child, particularly outside of marriage. Thus the shortened generation length further compromises the ability of those who may need more time to mature and develop; the material demands necessitated by childrearing are greatest on those whose families and communities have the least to offer; and the psychological drains are greatest on those whose development is already at greatest risk.

However, the research is also very clear that most teens do not want to become parents. More study is needed regarding the motivations of that small minority who do actively want to become parents before they are socially and economically ready for parenthood in a modern industrial economy. But these adolescents are few in number. The larger group are teens who do not want to become parents. However, the motivation of this group is not uniformly strong, and many teens feel considerable ambivalence. Sexual activity, pregnancy and parenthood each provide varied gratifications to teenagers as to adults, while contraception, abortion and adoption all pose costs that loom large in the eyes of adolescents. Teenagers with a strong sense of future opportunities, family and religious values, social and economic support, monitoring and alternative sources of status are considerably more likely to delay sex, use contraception if they have sex, and choose abortion or adoption if pregnancy occurs. Those teens who become parents and keep their children are often those without such strengths to support them.

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Table III-1

Percent of Females Aged 15-19 by Exposure to Risk of Unintended Pregnancy, 1982 and 1988

	Females Aged 15-19	
	1982	1988
Never Had Intercourse	52.9	46.8
Ever had Intercourse	47.1	53.2
No Intercourse in past 3 months	6.1	7.7
Pregnant	4.8	2.8
Postpartum	0.6*	0.4*
Seeking Pregnancy	1.3*	1.1*
Sterile	0.5	1.1
Noncontraceptively†	0.4*	0.5
Contraceptively	0.1*	0.6*
Reversible Method User	24.1	31.6
Non User	9.7	8.6
Total	100.0	100.0

† Data for 1982 supplied by W.D. Mosher, NCHS

* Denotes proportions with relative standard error of 30 percent or more.

Source: Forrest, J.D. and Singh, S. 1990. "The Sexual Reproductive Behavior of American Women, 1982-1988", *Family Planning Perspectives* 22(5): 206-214.

Table III-2

Percent Contraceptive Use Among Females Aged 15-19 at Risk of Unintended Pregnancy, by Poverty Level, 1988

		Poverty Level	
	All	< 200%	≥ 200%
Female Sterilization	1.2*	2.4*	0.0
Male Sterilization	0.2*	0.0	0.4*
Reversible Method	77.5	72.5	82.6
No Method	21.2	25.1	17.0
	100.0	100.0	100.0

* Denotes proportions with relative standard error of 30 percent or more.

Note: The definition of "at risk" excludes females who have never had intercourse, had not had intercourse in the past 3 months, are pregnant/postpartum/seeking pregnancy, and who are non-contraceptively sterile.

Source: Forrest, J.D. and Singh, S. 1990. "The Sexual Reproductive Behavior of American Women, 1982-1988", *Family Planning Perspectives* 22(5): 206-214.

Table III-3

Number and Percent of Females Aged 15-19 Using Contraception and Percent of Users who Rely on Various Methods, 1982, 1988, and 1990

	1982	1988	1990
Number Using Contraception (in thousands)	2,302	2,950	2,623
Percent Using Contraception	24%	32%*	32%
Percent of Users by Method:			
Female Sterilization	0	2	0
Male Sterilization	0	0	0
Pill	64	59	52
IUD	1	0	0
Diaphragm	6	1*	0
Condom	21	33*	44
Periodic Abstinence	na	na	1
Other	na	na	3
	100	100	100

*Change from 1982 to 1988 is significant at $p \leq 0.05$.

na - Not available

Source: Mosher, W. D. 1990. "Contraceptive Practice in the United States, 1982-1988," *Family Planning Perspectives*, 22(5): 198-204; Peterson, L.S. (1995). Contraceptive Use in the United States: 1982-1990. *Advance Data* No. 260, Vital and Health Statistics of the Centers for Disease Control and Prevention/National Center for Health Statistics.

Table III-4

Percent Sexually Active Young Males and Percent Using Contraception at Last Intercourse Among Sexually Active Young Males, 1979-1991

	Urban Males, Aged 17-19			All Males, Aged 17.5-19		
	1979 NSYM	1988 NSAM	*P*	1988 NSAM	1991 NSAM	*P*
Percent Sexually Experienced	66%	76%	p<0.01	76%	79%	NS
Contraceptive Use at Last Intercourse Among Sexually Experienced:						
Condom Alone or with other Methods	20	54	p<0.01	53	56	NS
Female Method Only	29	25		27	23	
No or Ineffective Method	51	21		20	21	
	100	100		100	100	

Source: National Survey of Young Men, 1979 (NSYM). Analyses by Zelnick and Kanter; National Survey of Adolescent Males, 1988 and 1991 (NSAM). Analyses by Sonenstein, Pleck, and Ku.

Table III-5

Percent of Females Under Age 20 Experiencing Contraceptive Failure During the First 12 Months of Use Among All Females, and Percent Among Never Married Females by Poverty Status, 1988

	All	Never Married	
		<200% Poverty	≥200% Poverty
Females <20	25.9%	- -	- -
By Method:			
Pill	--	12.9%	5.9%
Condom	--	27.3	13.2
Diaphragm	--	37.3	*
Periodic Abstinences	--	51.7	27.5
Spermicides	--	49.8	26.3
Other	--	43.7	22.5

* Indicates subgroups represented in the NSFG by fewer than five use intervals. Note: This model includes duration of use, method, age, marital status and poverty status, as well as the interactions of duration and poverty status and of age and marital status.

Source: Jones, E. F. and Forrest, J. D. (1992). Contraception Failure Rates. *Family Planning Perspectives,* 24(1): 12-19.

Table IV-1

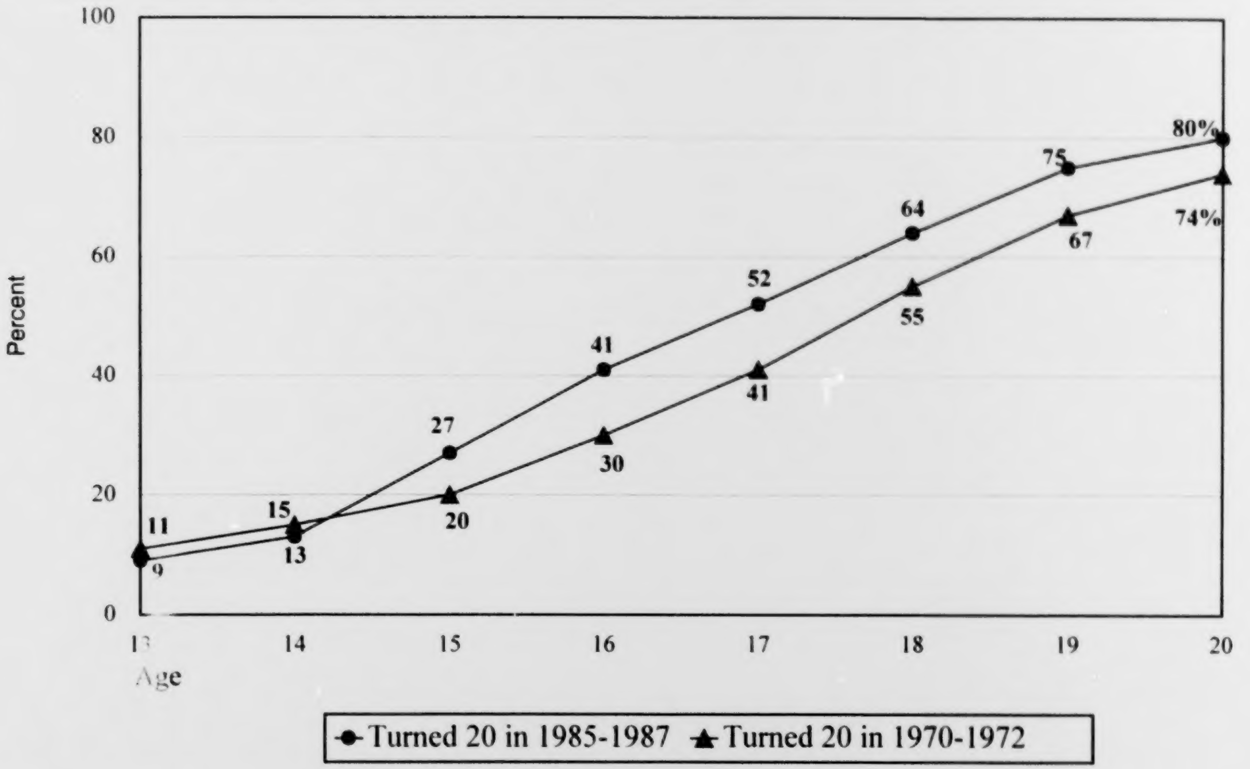
Unintended Pregnancies (excluding miscarriages) to Females Aged 15-19 by Outcome, 1982-1990

Year	Percent ending in Birth	Percent ending in Abortion
1982	47	53
1987	49	51
1990	51	49

Source: Forrest, J.D. and Singh, S. (1990). "The Sexual and Reproductive Behavior of American Women, 1982-1988." Family Planning Perspectives, 22:206-214; Alan Guttmacher Institute. (1994). *Sex and America's Teenagers*. New York, NY: Alan Guttmacher Institute.

Figure II-A

Percent of Males Who Have Had Intercourse by Each Age, 1970-72 and 1985-87 Cohorts

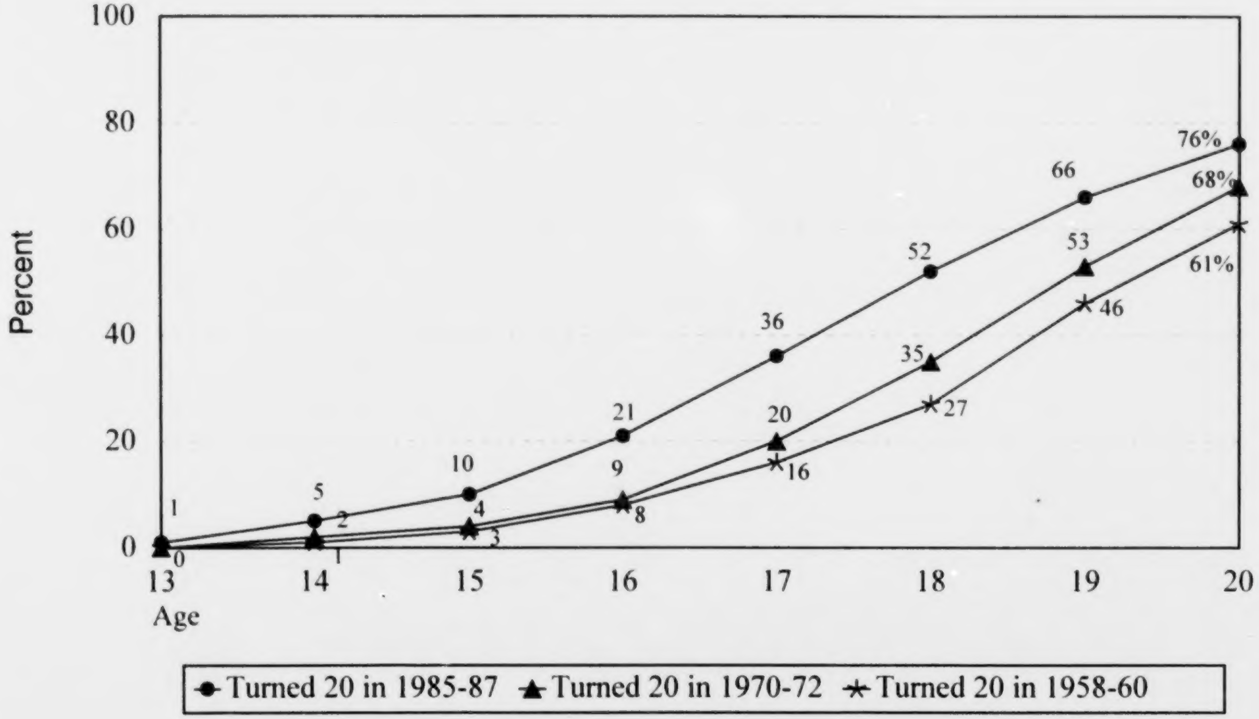


Note: Data are based on men aged 21-23 and 36-38 in 1988.

Source: Alan Guttmacher Institute. (1994). *Sex and America's Teenagers*. New York, NY: Alan Guttmacher Institute: Henshaw, SK. (1994). U.S. Teenage Pregnancy Statistics. New York, NY: Alan Guttmacher Institute.

Figure II-B

Percent of Females Who Have Had Intercourse by Each Age, 1958-60, 1970-72 and 1985-87 Cohorts

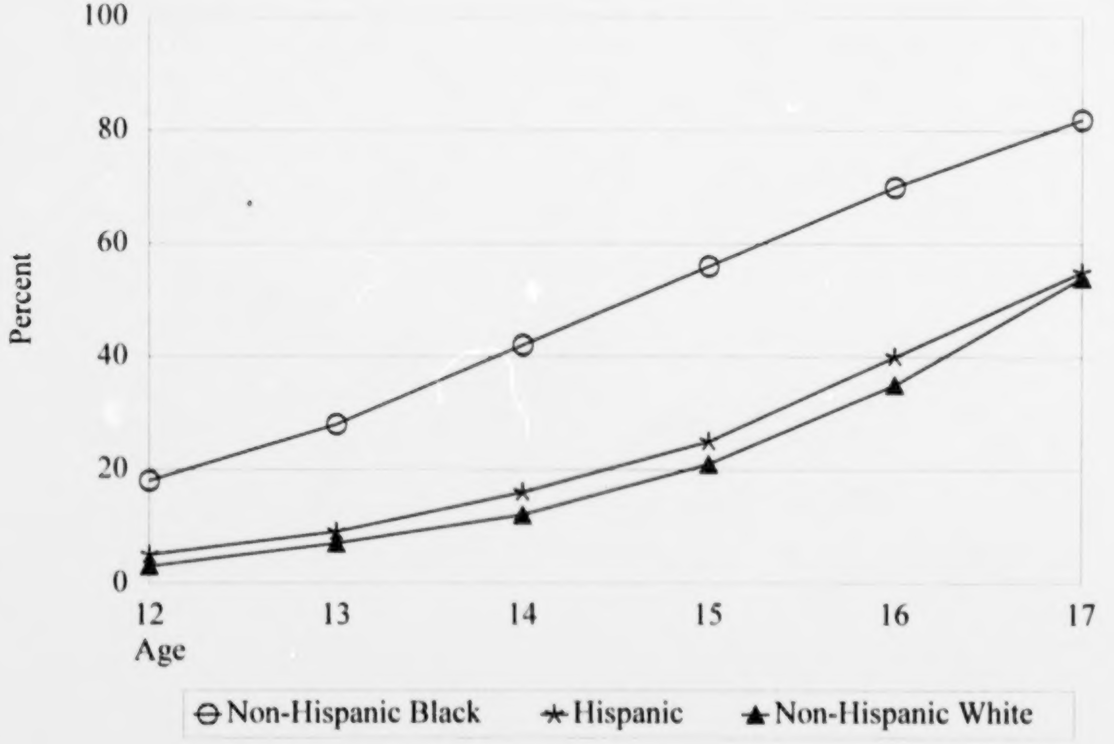


Note: Data are based on women aged 30-32 and 42-44 in 1982, and aged 21-23 and 36-38 in 1988.

Source: Alan Guttmacher Institute. (1994). *Sex and America's Teenagers*. New York, NY: Alan Guttmacher Institute: Henshaw, SK. (1994). U.S. Teenage Pregnancy Statistics. New York, NY: Alan Guttmacher Institute.

Figure II-C

Percent of Males Who Have Had Intercourse by Each Age and by Race/Ethnicity, 1992

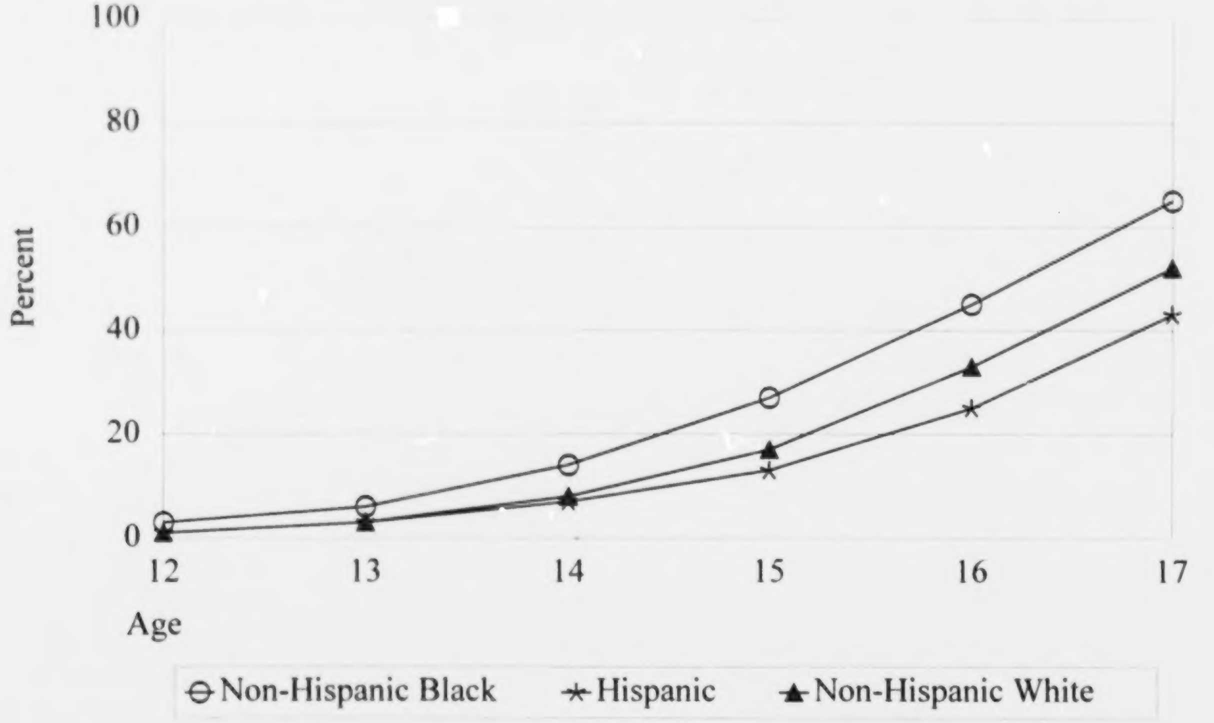


Note: Data are based on males aged 15-21 in 1992.

Source: Life Tables by Child Trends, Inc., of the National Health Interview Survey - Youth Risk Behavior Supplement, 1992, weighted analyses.

Figure II-D

Percent of Females Who Have Had Intercourse by Each Age and by Race/Ethnicity, 1992

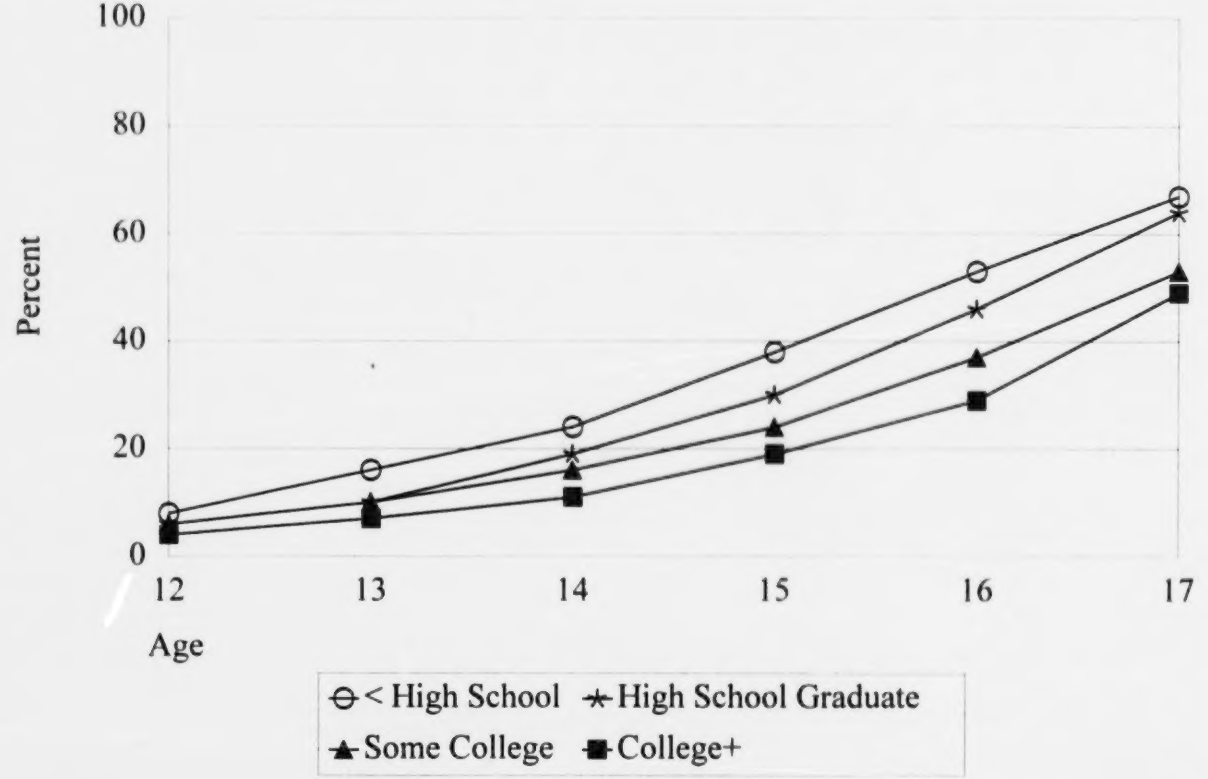


Note: Data are based on females aged 15 - 21 in 1992.

Source: Life Tables by Child Trends, Inc., of the National Health Interview Survey - Youth Risk Behavior Supplement, 1992, weighted analyses.

Figure II-E

Percent of Males Who Have Had Intercourse by Each Age by Parent's Education, 1992

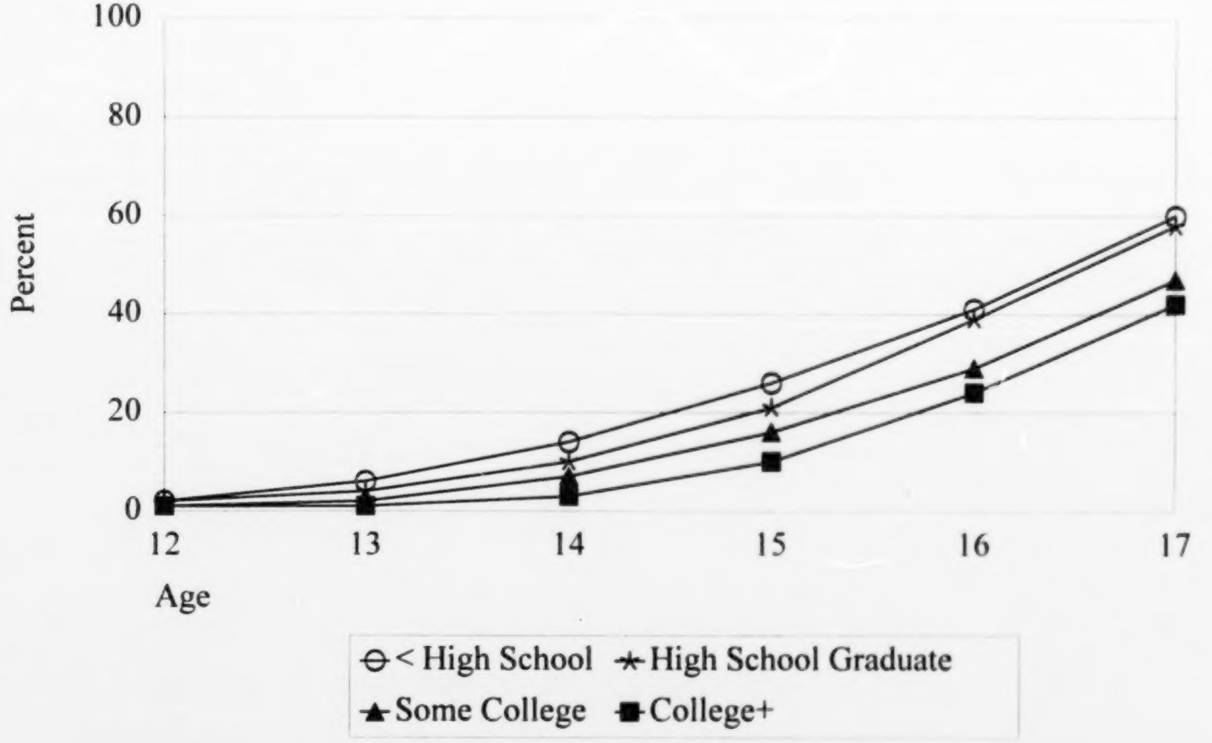


Note: Data are based on males aged 15-21 in 1992.

Source: Life Tables by Child Trends, Inc., of the National Health Interview Survey - Youth Risk Behavior Supplement, 1992, weighted analyses.

Figure II-F

Percent of Females Who Have Had Intercourse by Each Age by Parent's Education, 1992

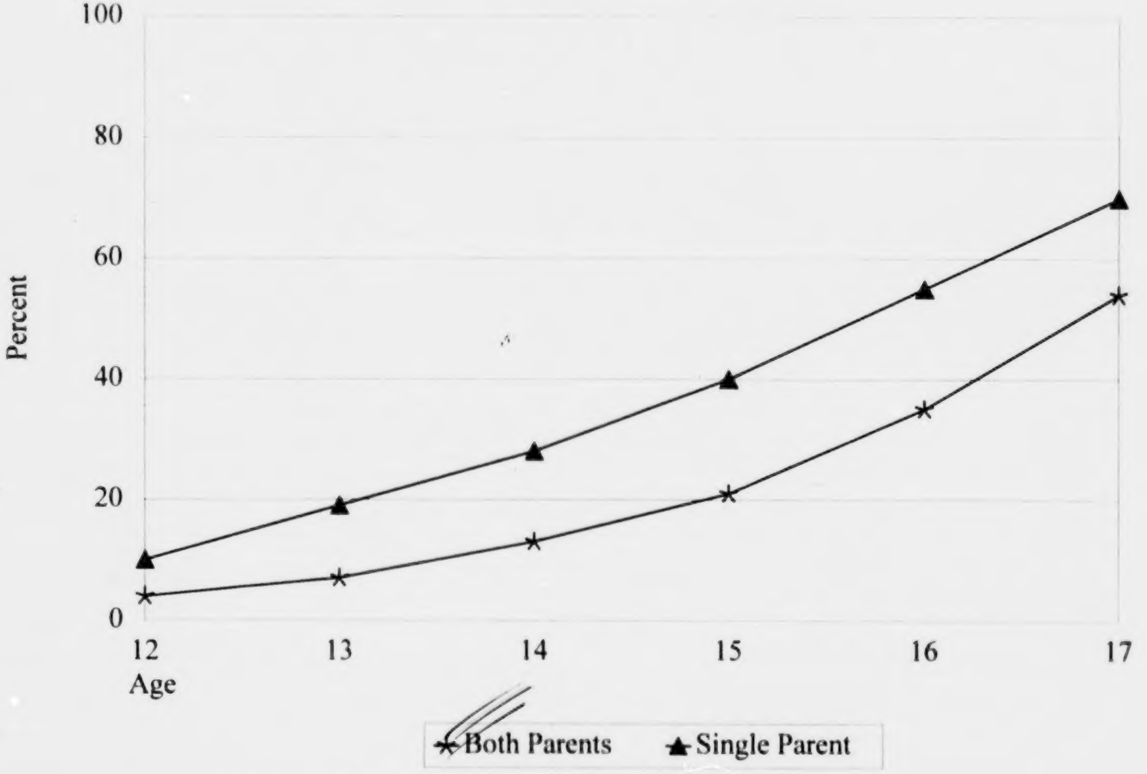


Note: Data are based on females aged 15-21 in 1992.

Source: Life Tables by Child Trends, Inc., of the National Health Interview Survey - Youth Risk Behavior Supplement, 1992, weighted analyses.

Figure II- G

Percent of Males Who Have Had Intercourse by Each Age by Family Structure, 1992

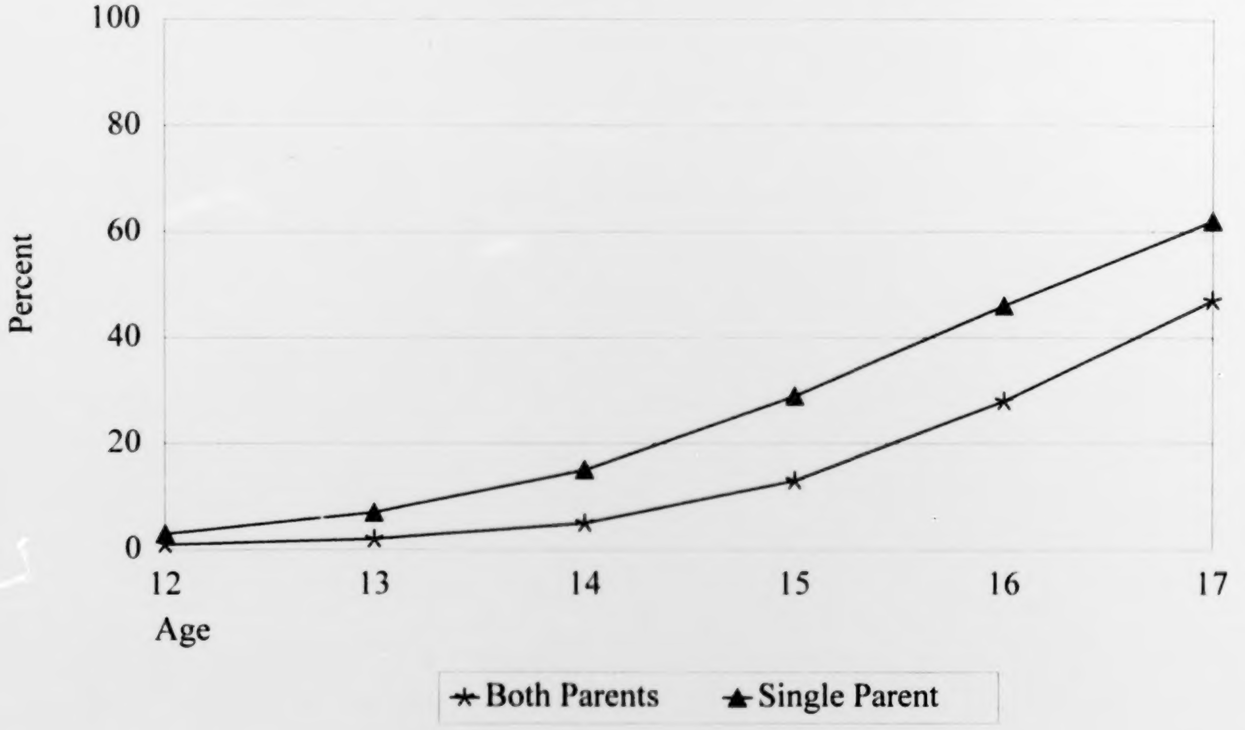


Note: Data are based on males aged 15-21 in 1992.

Source: Life Tables by Child Trends, Inc., of the National Health Interview Survey - Youth Risk Behavior Supplement, 1992, weighted analyses.

Figure II-H

Percent of Females Who Have Had Intercourse by Each Age by Family Structure, 1992

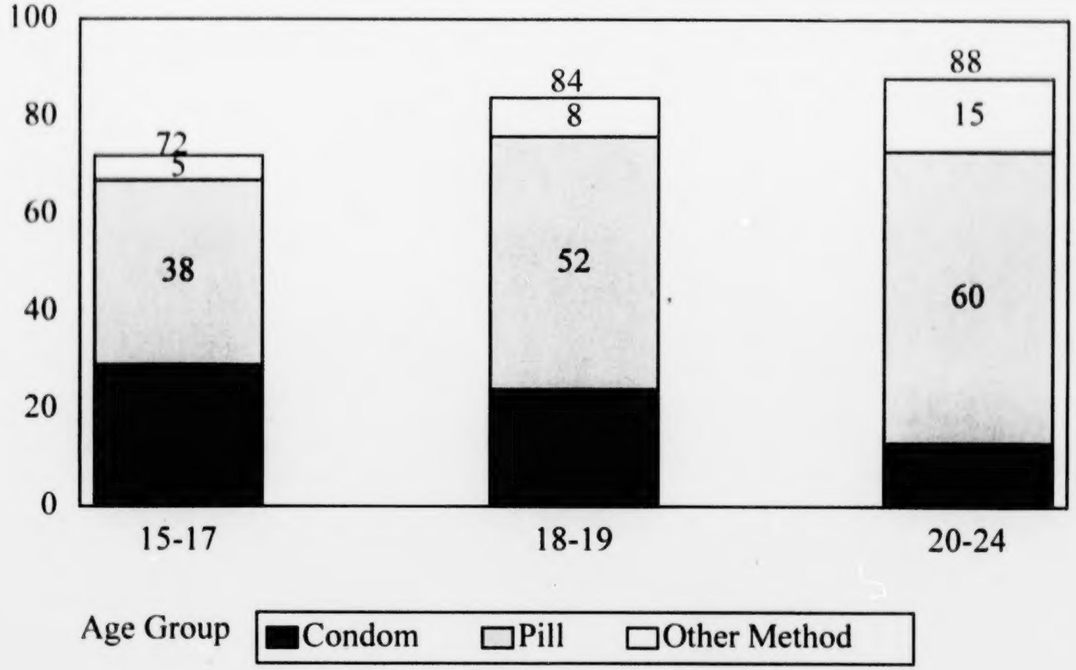


Note: Data are based on females aged 15-21 in 1992.

Source: Life Tables by Child Trends, Inc., of the National Health Interview Survey - Youth Risk Behavior Supplement, 1992, weighted analyses.

Figure III-A

Percent Using a Contraceptive Among Females Aged 15-24 at Risk of Unintended Pregnancy*, by Age Group, 1988

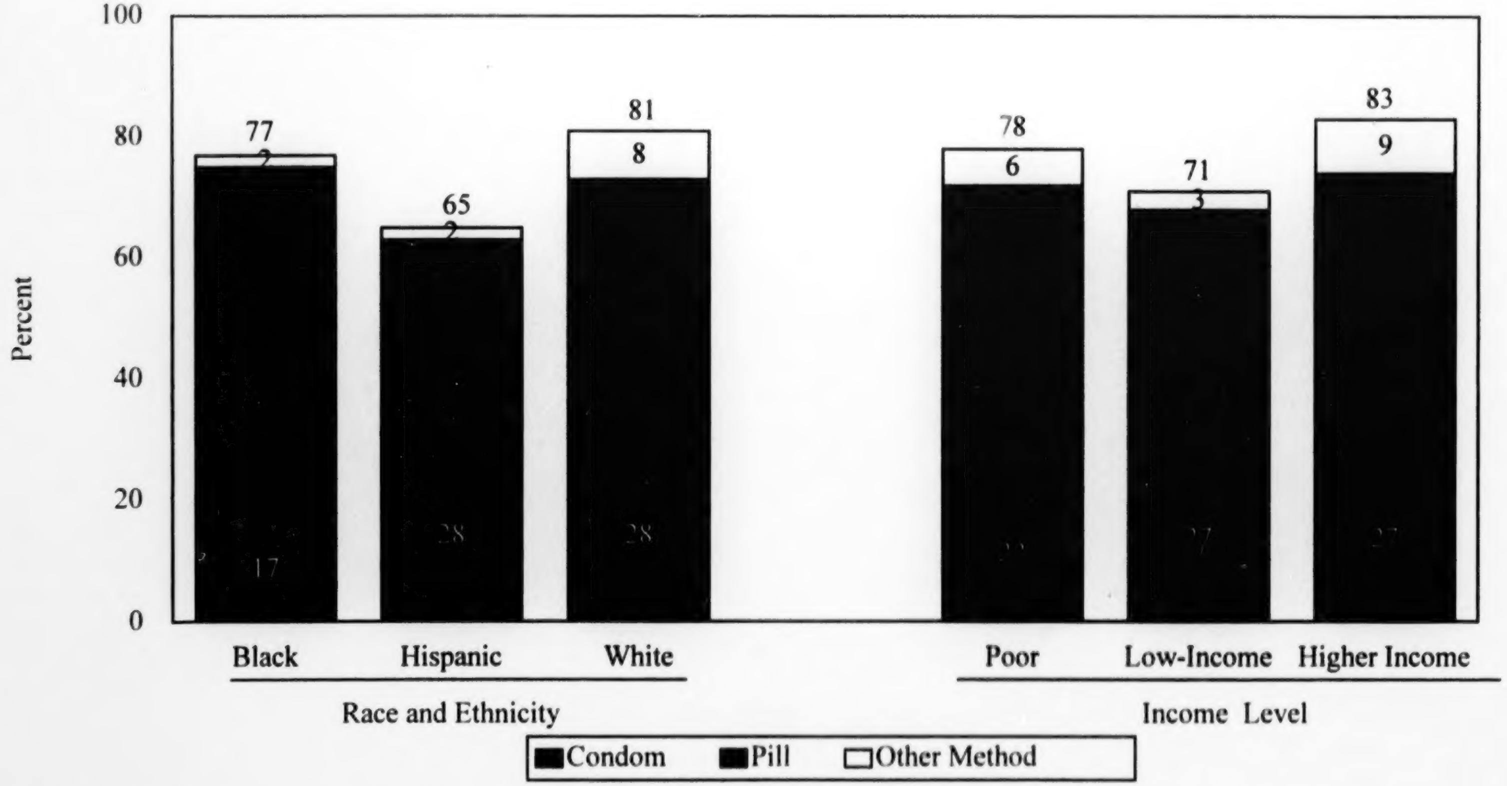


* This definition of "At Risk" includes women who have ever had sex.

Source: Alan Guttmacher Institute (1994). *Sex and America's Teenagers.* New York, NY: Alan Guttmacher Institute, Figure 24.

Figure III-B

Percent Using a Contraceptive Among Females Aged 15-19 at Risk of Unintended Pregnancy*, by Race/Ethnicity and Income Level, 1988

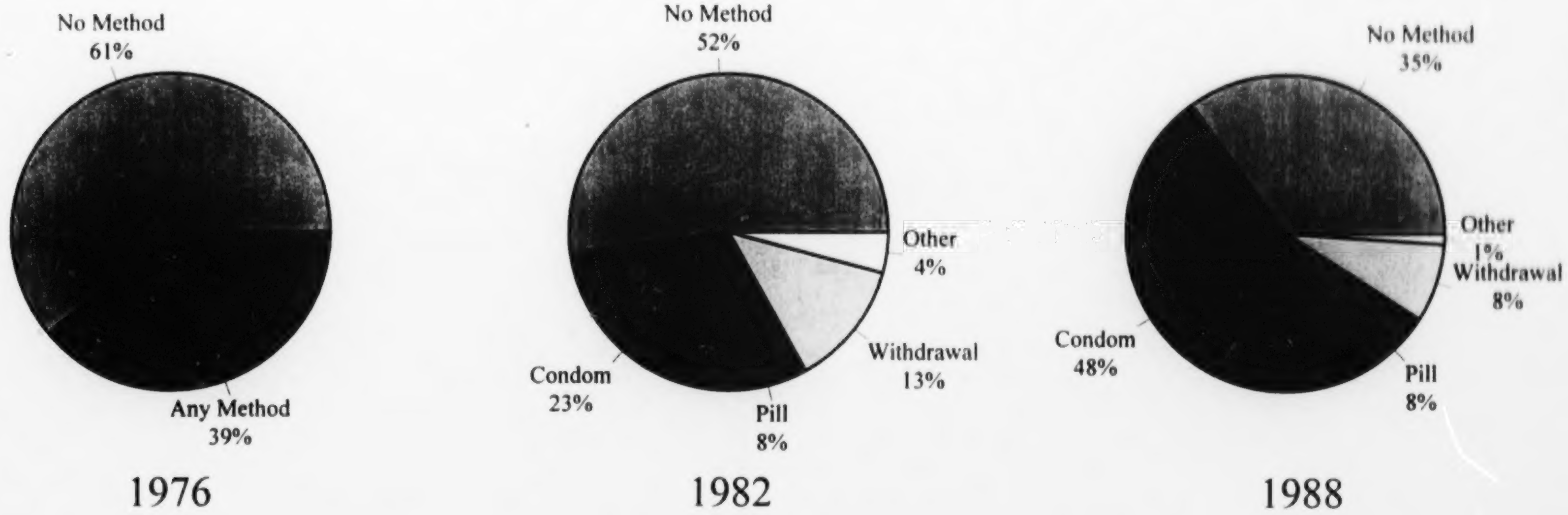


* This definition of "At Risk" includes women who have ever had sex.

Source: Alan Guttmacher Institute (1994). *Sex and America's Teenagers*. New York, NY: Alan Guttmacher Institute.

Figure III-C

Contraceptive Use at First Intercourse Among Sexually Experienced Females Aged 15-19 at Interview, 1976, 1982, and 1988

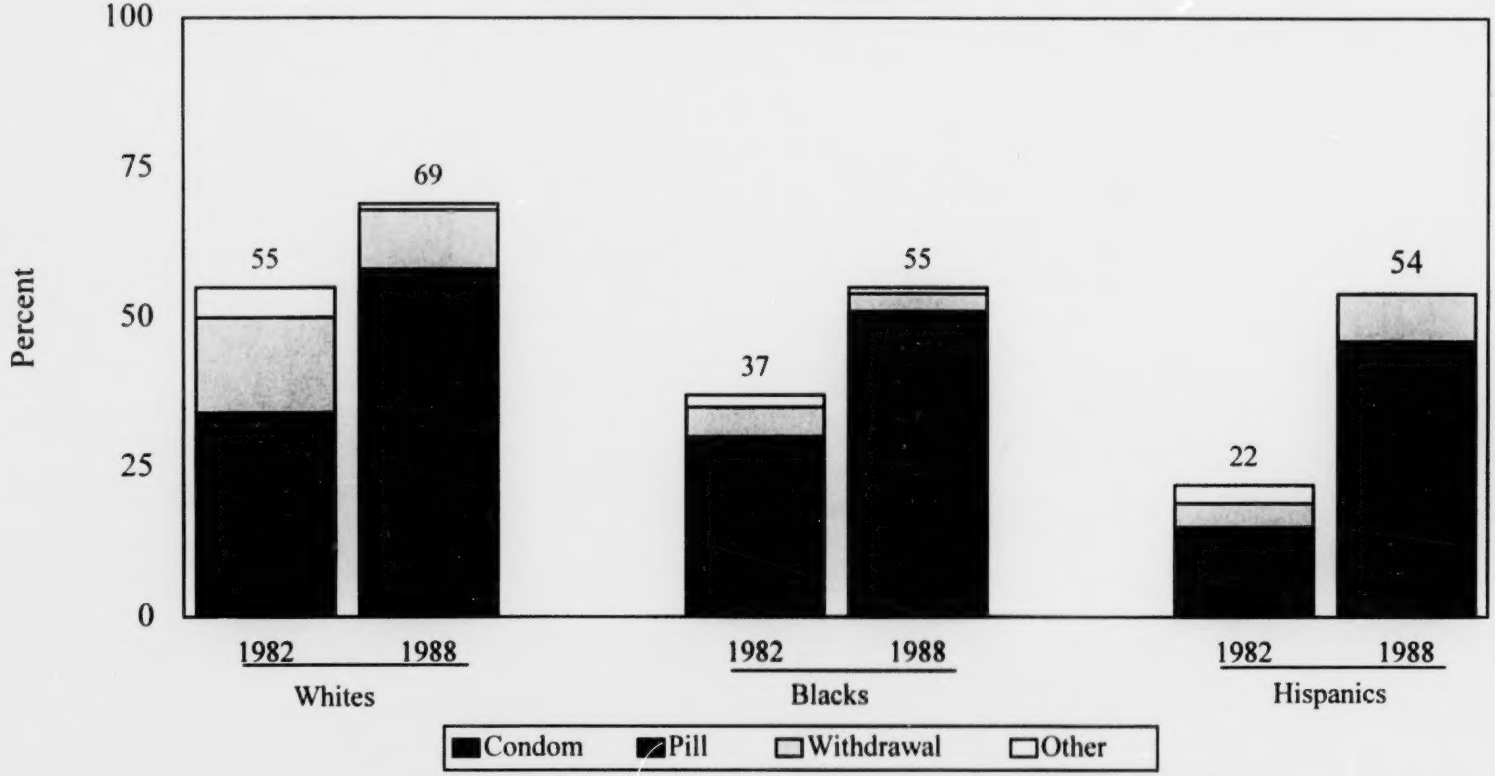


Note: Data for 1976 excludes females who have only had intercourse once (13.3% of all premaritally sexually active women). This probably means that the percent of non users is underestimated because they are likely to be in that group.

Source: Forrest, J. D., and Singh, S. (1990). The Sexual and Reproductive Behavior of American Women, 1982-1988, *Family Planning Perspectives*, 22: 206-214; Zelnik, M. and Kanter, J. F. (1978). Contraceptive Patterns and Prenatal Pregnancy Among Women Aged 15-19 in 1976. *Family Planning Perspectives*, 10(3): 135-142.

Figure III-D

Percent Contraceptive Use at First Intercourse Among Sexually Experienced Females Aged 15-19 at Interview, by Race/Ethnicity, 1982 and 1988

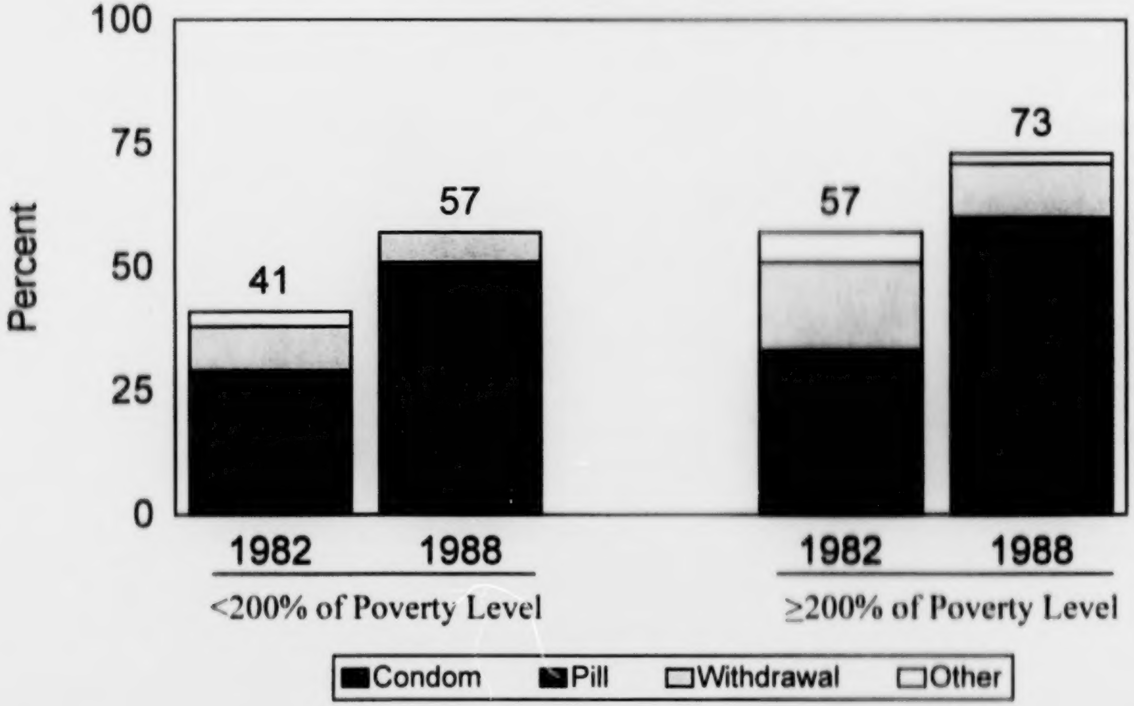


Note: The percent of Hispanics estimated to have used "other" methods in 1988 was 0 percent.

Source: Forrest, J. D., and Singh, S. (1990). The Sexual and Reproductive Behavior of American Women, 1982-1988, *Family Planning Perspectives*, 22: 206-214.

Figure III-E

Percent Contraceptive Use at First Intercourse Among Sexually Experienced Females Aged 15-19 at Interview, by Poverty Level, 1982 and 1988

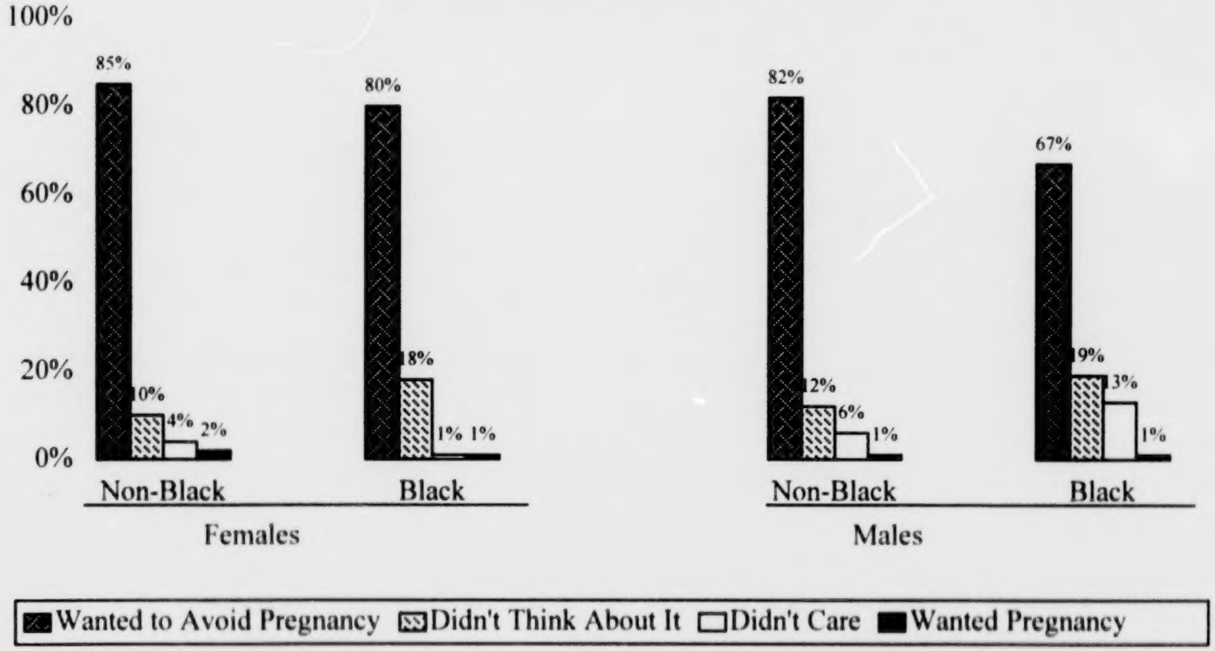


Note: The percent of females < 200% of the poverty level in 1988 estimated to have used an "other" method was 0.2 percent.

Source: Forrest, J. D., and Singh, S. (1990). The Sexual and Reproductive Behavior of American Women, 1982-1988, *Family Planning Perspectives*, 22: 206-214.

Figure III-F

Pregnancy Intention at First Intercourse Among Youth Who Had First Intercourse at Age 17 or Younger, by Race/Ethnicity and Gender, 1987

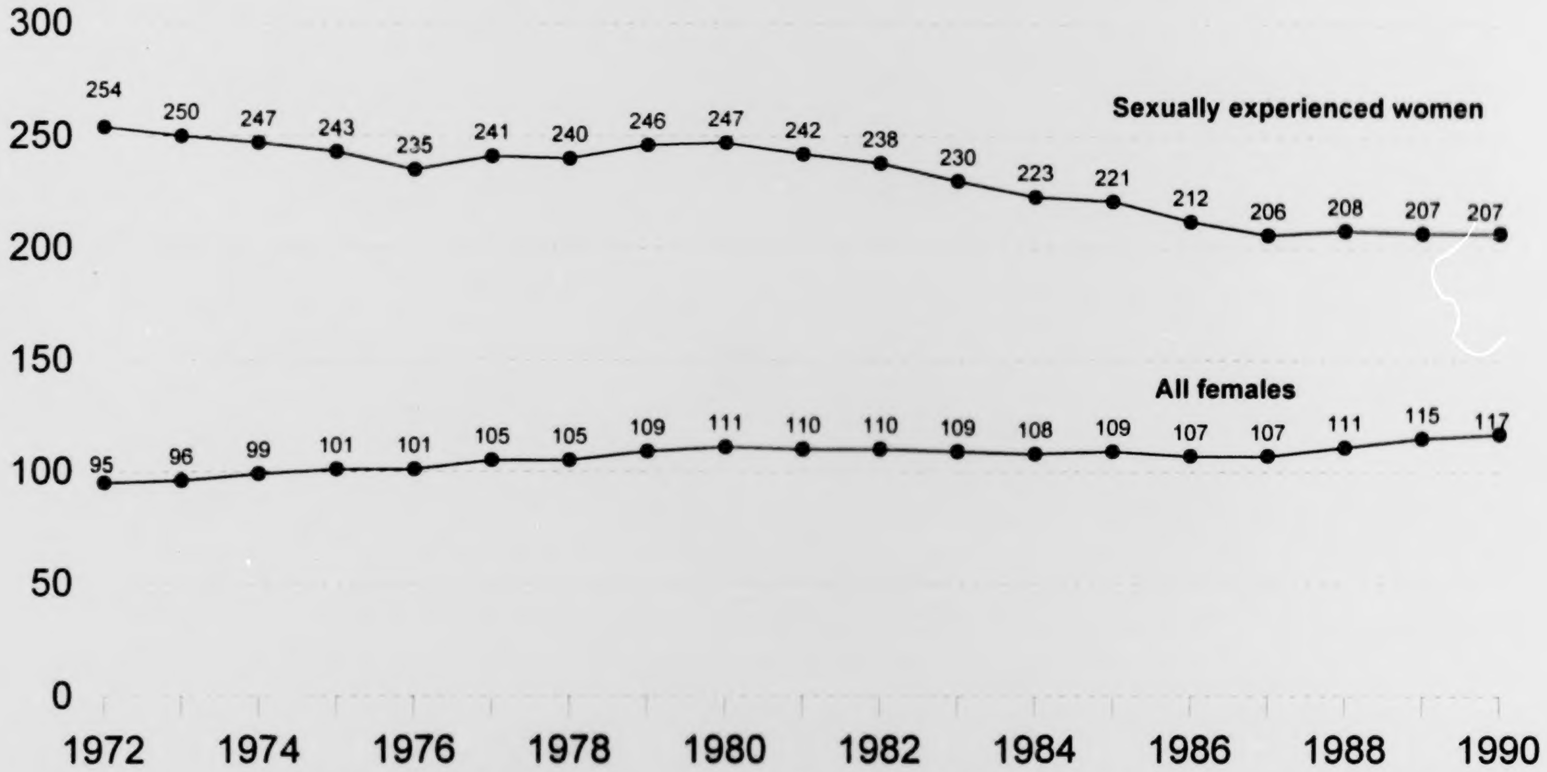


Note: Analyses are based on retrospective reports of youth aged 18 to 22 in the 1987 wave of the National Survey of Children.

Source: Moore, K.A. and Peterson, J.L. (1989). "*The consequences of teenage pregnancy.*" Final Report to NICHD and ASPE/DHHS, Grant No. HD 21537.

Figure IV-A

Pregnancies per 1,000 Females Aged 15-19, by Sexual Experience
1972-1990

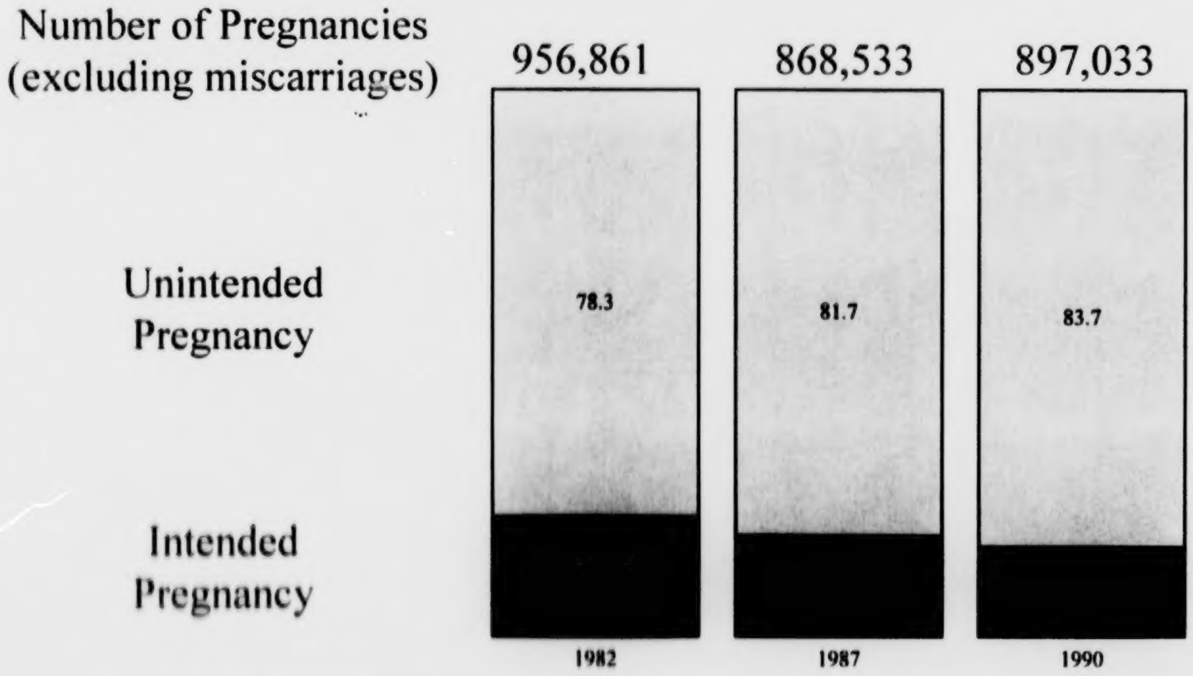


Note: Pregnancies are calculated as the sum of births, abortions, and miscarriages. Miscarriages are estimated as 20% of live births and 10% of abortions.

Source: Alan Guttmacher Institute. (1994). *Sex and America's Teenagers.* New York, NY : Alan Guttmacher Institute, Figure 30.

Figure IV-B

Percent of Pregnancies (excluding miscarriages) to Females < Age 20, by Intention, 1982-1990

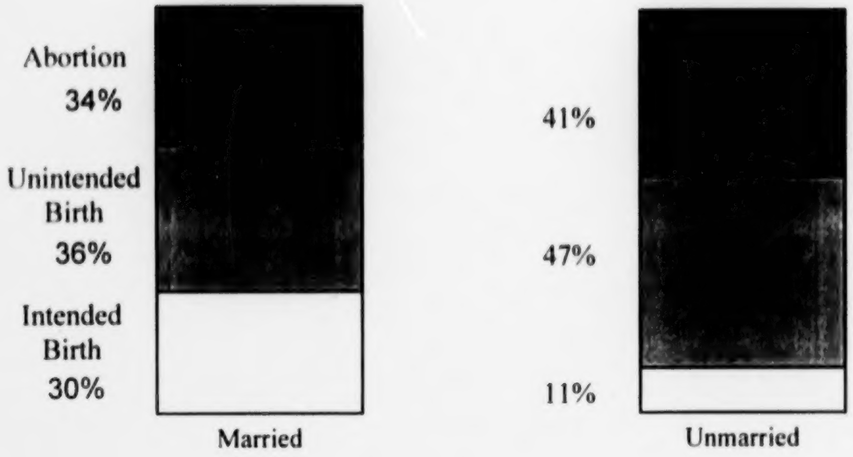


Note: Pregnancies are calculated as the sum of births and abortions.

Source: Forrest, J.D. and Singh, S. (1990). The Sexual and Reproductive Behavior and American Women, 1982-88. *Family Planning Perspectives*, 22 (5): 260-214; Alan Guttmacher Institute. (1994). *Sex and America's Teenagers.* New York, NY: Alan Guttmacher Institute: Henshaw, S.K. (1994). U. S. Teenage Pregnancy Statistics. New York, NY: Alan Guttmacher Institute.

Figure IV-C

Percent of Pregnancies (excluding miscarriages) to Females under Age 20, by Intention and by Marital Status, 1987

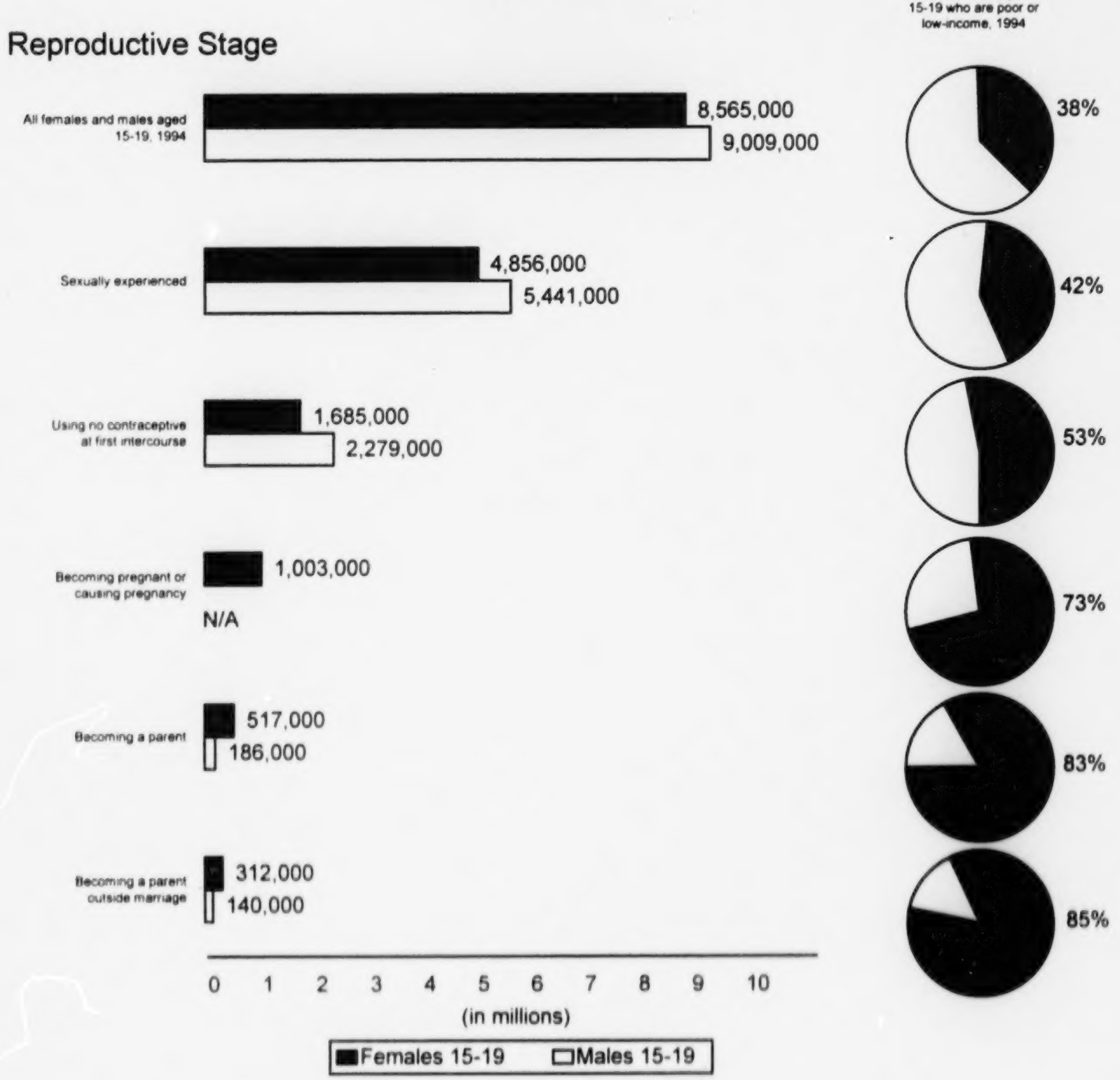


Note: Age, pregnancy outcome, and marital status are measured at the time of conception.

Source: National Survey of Family Growth, tabulations by the Alan Guttmacher Institute, January 1995.

Figure IV-D

Proportion of Females Aged 15-19 who are Poor or Low Income, by Reproductive Stages, 1994

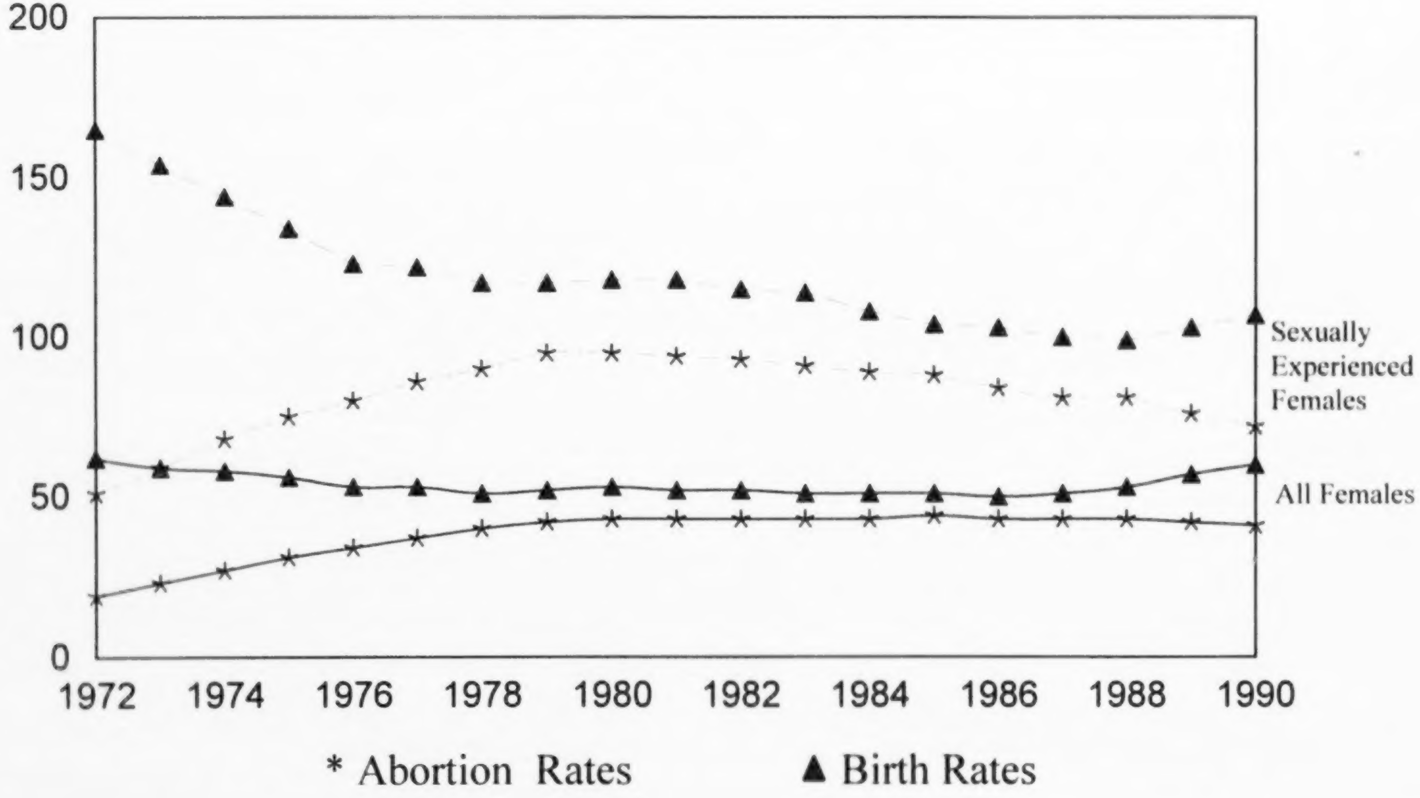


Note: Poor is defined as at or below the poverty level, low income is defined as 100-199% of the poverty level.

Source: The Alan Guttmacher Institute. (1994). *Sex and Americas Teenagers.* New York, NY: Author.

Figure IV-E

Birth Rates and Abortion Rates to Females Aged 15-19, by Sexual Experience, 1972-1990

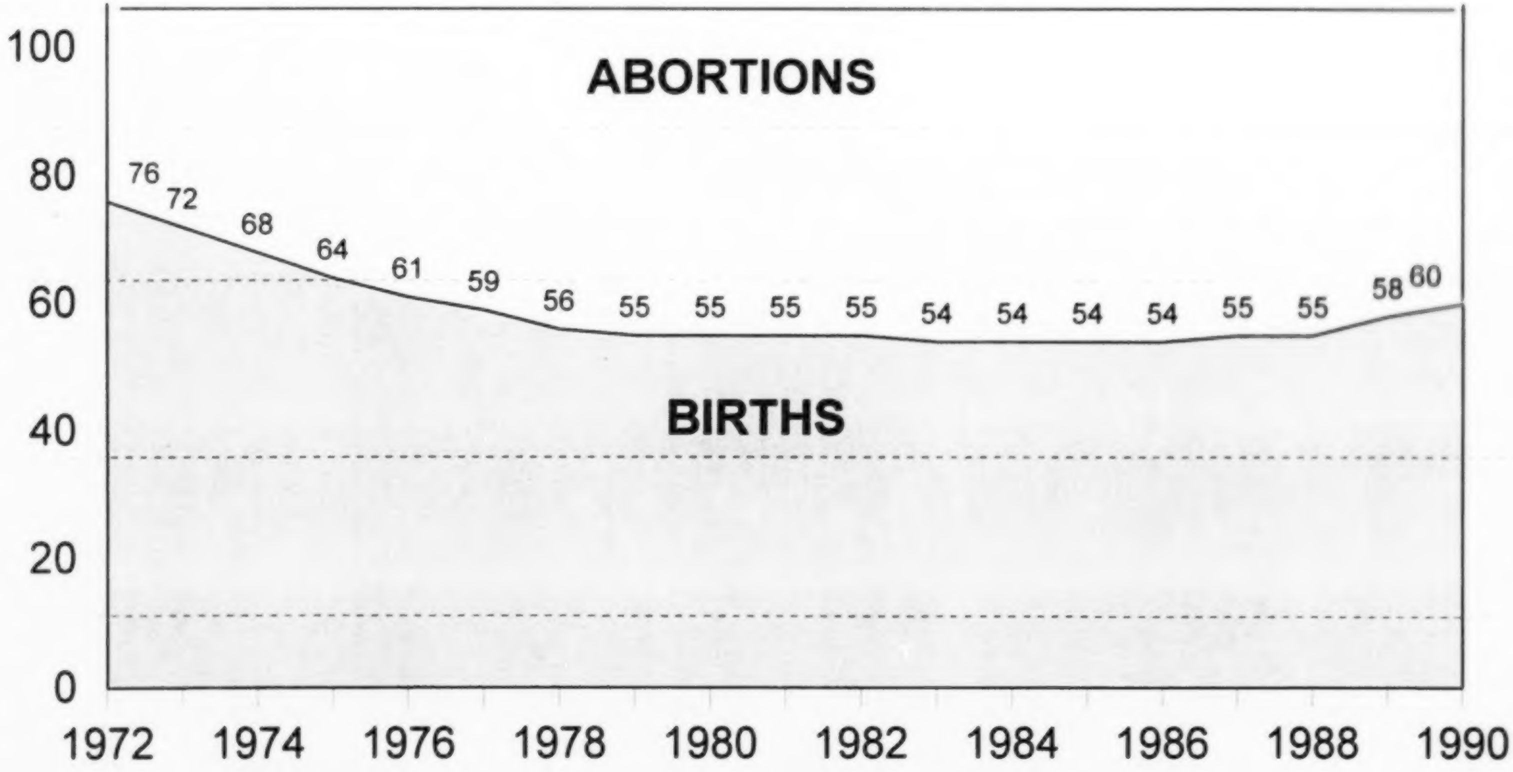


Note: Rates refer to the number per 1,000 females aged 15-19.

Source: Alan Guttmacher Institute (1994). *Sex and America's Teenagers*. New York, NY: Alan Guttmacher Institute.

Figure IV-F

Percent of Pregnancies Among Women Aged 15-19 Ending in Birth and Abortion, 1972-1990

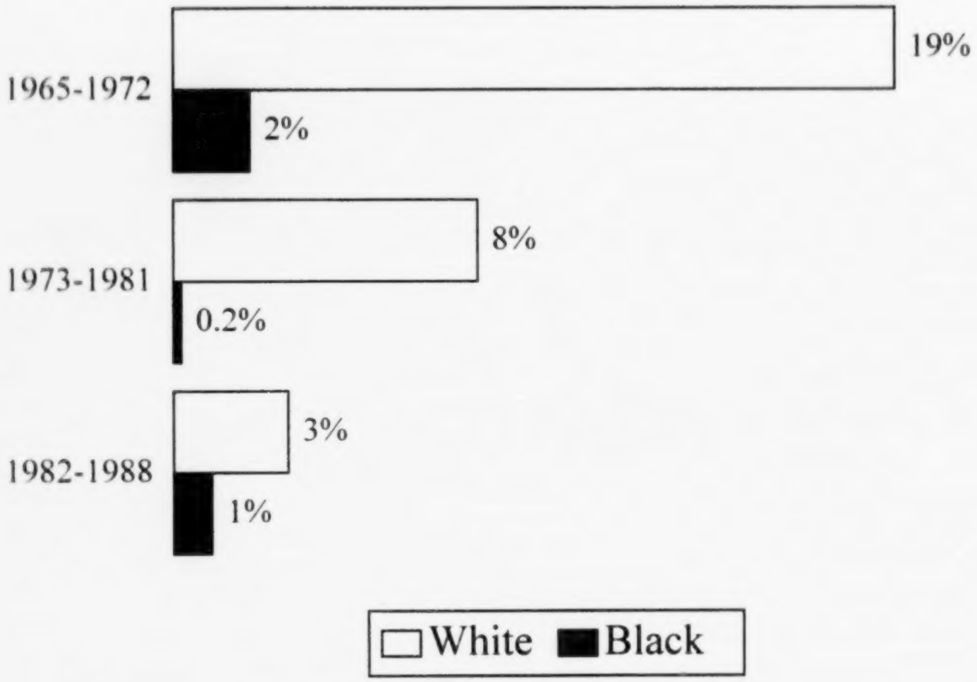


Note: Pregnancies do not include miscarriages. They are calculated as the sum of births and abortions.

Source: Alan Guttmacher Institute (1994). *Sex and America's Teenagers.* New York, NY: Alan Guttmacher Institute.

Figure IV-G

Percent of Babies Placed for Adoption Among those Born to Never-Married Women, 1965-1988

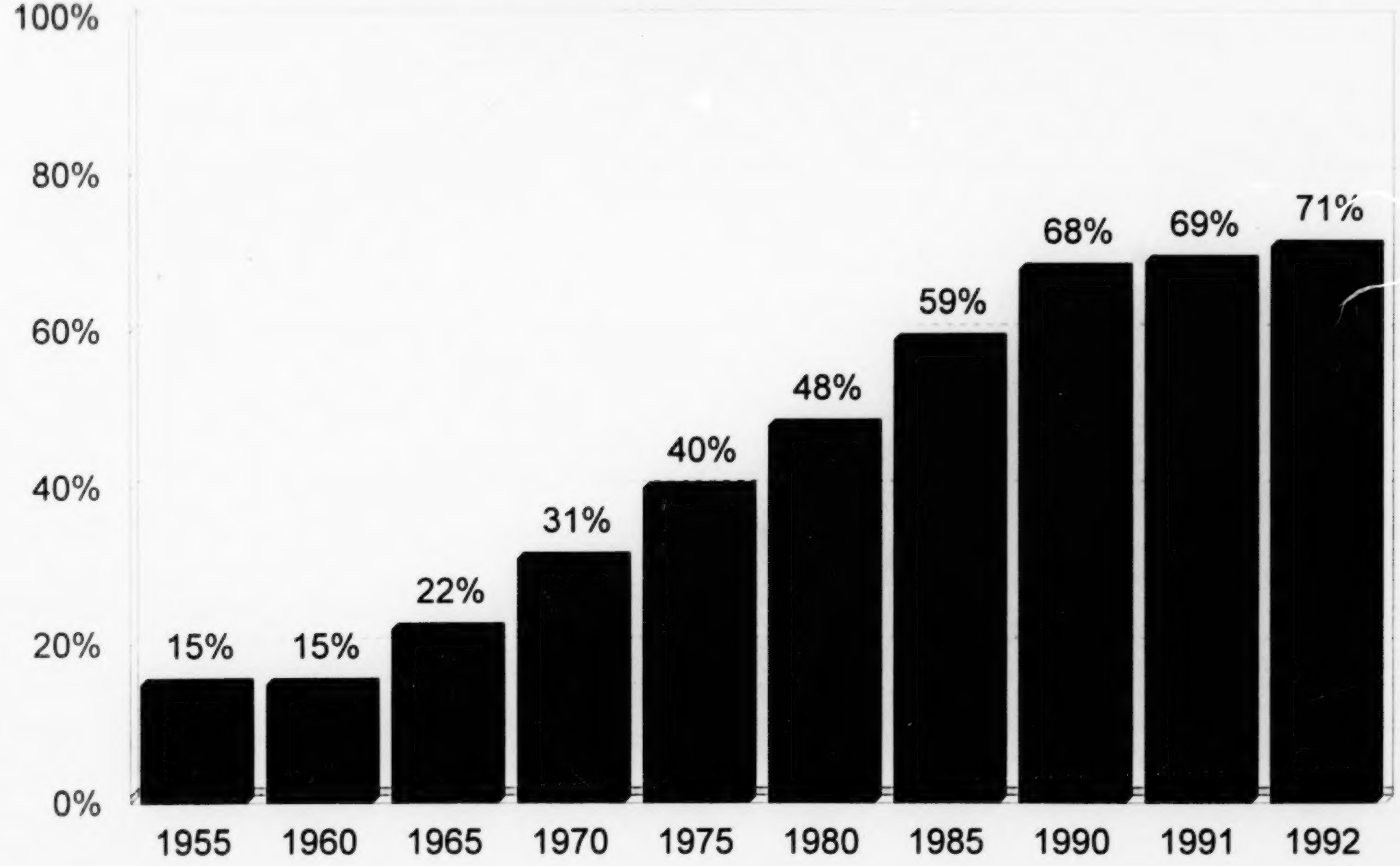


Note: In this figure, "white" is defined as "white, non-Hispanic," and "black is defined as "black non-Hispanic," Percentages are based on data from the 1982 and 1988 National Survey of Family Growth and refer to premarital births that had occurred to women who were aged 15-44 at either survey.

Source: C.A. Bachrach, K.S. Stolley and K.A. London, "Relinquishment of Premarital Births: Evidence from National Survey Data.." *Family Planning Perspectives,* 24:27-32, 48, 1992.

Figure IV-H

Percent of Births to Females < Age 20 That Occurred Outside of Marriage, 1955-1992

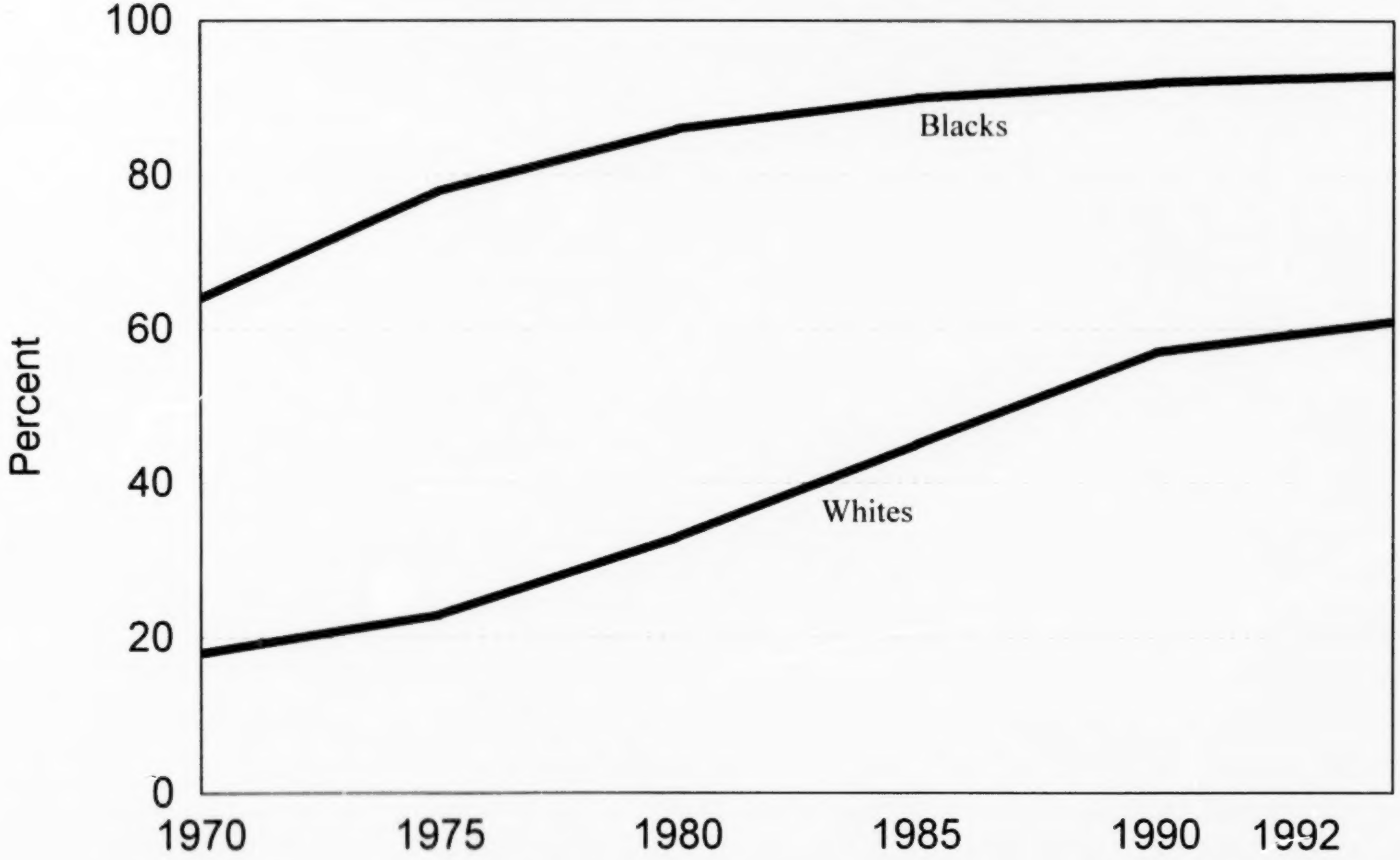


Source: Compiled by Child Trends, Inc., with data from annual Natality volumes of the Vital Statistics Branch of the National Center for Health Statistics.

CONG7.PRS

Figure IV-I

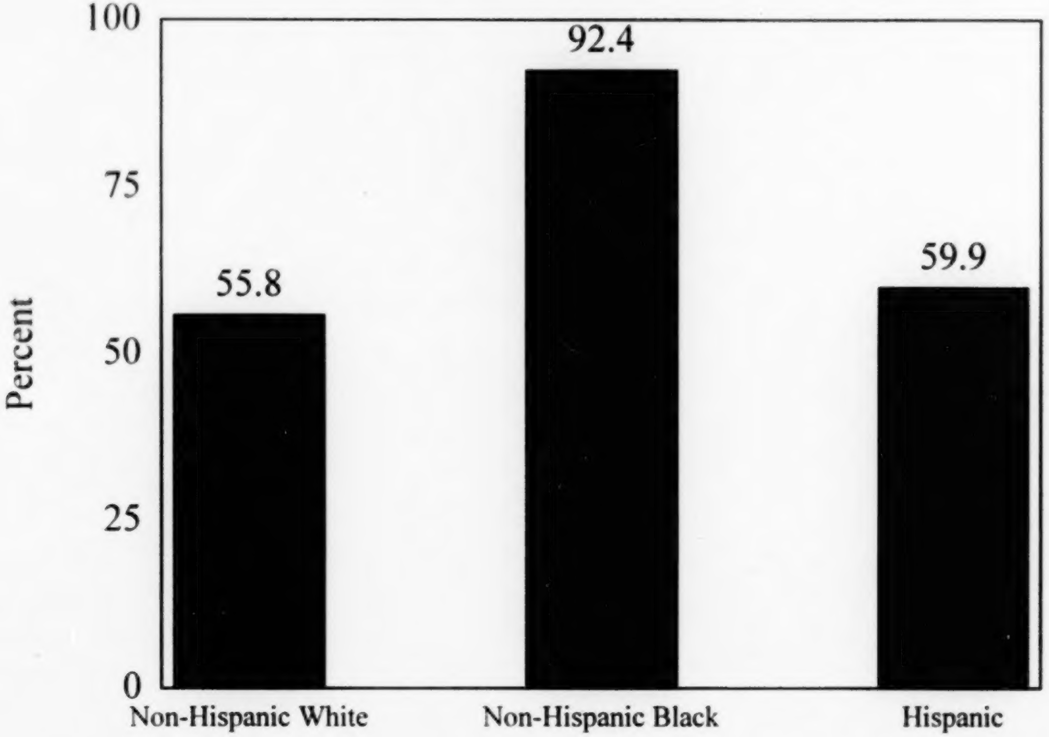
Percent of Births to Females < Age 20 That Occurred Outside of Marriage, by Race, 1970-1992



Source: Compiled by Child Trends, Inc., with data from annual Natality volumes of the Vital Statistics Branch of the National Center for Health Statistics.

Figure IV-J

Percent of Births to Females < Age 20 That are Non-Marital, by Race and Ethnic Origin*, 1990

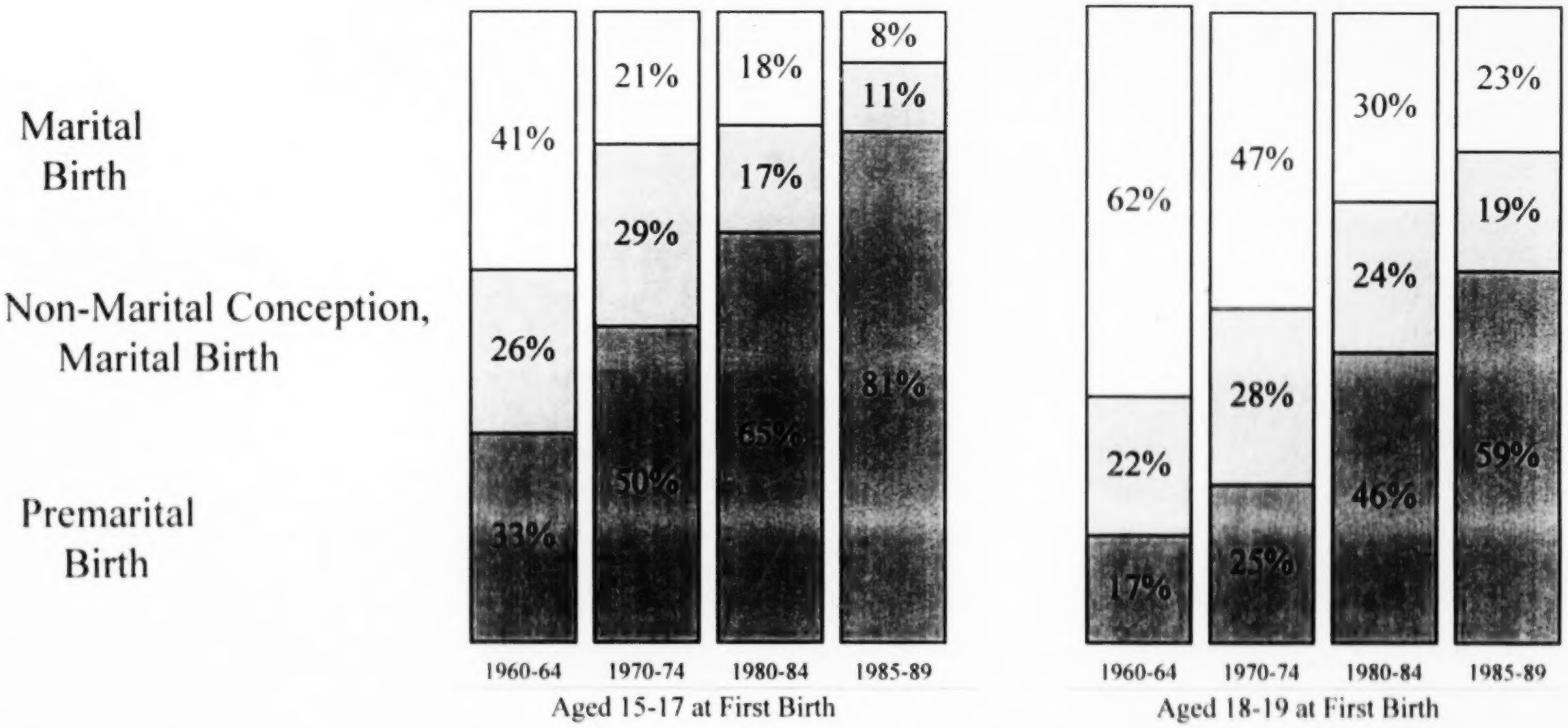


* Data by ethnic origin is available only for 48 states and the District of Columbia. These statistics are based on that population.

Source: Compiled by Child Trends, Inc., with data from the Vital Statistics Branch of the National Center for Health Statistics.

Figure IV-K

Marital Status of Females Aged 15-17 and 18-19 at First Birth, 1960-64 to 1985-89



Source: Bachu, A. (1991). Fertility of American Women: June 1990. Current Population Report Series P-20, No . 454, Table E.

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APPENDIX

Description of Surveys

National Longitudinal Study of Adolescent Health (Add Health)

This study is funded by the National Institute of Child Health and Human Development. It proposes a national sample of 7th to 12th grade students and their parents. The basic sample will be drawn from a stratified probability sample of 80 high schools and 80 feeder schools (middle or junior high schools) nationwide. The base year data will be collected in the schoolds from all students attending 7-12 grades. Data from the school administrators about school policies and characteristics will also be collected in a questionnaire. Subsequent interviews (after one and two years) will be conducted in individuals' homes with a subsample of 19,000 adolescents drawn from the school rosters and with a parent of each adolescent.

High School and Beyond Survey

This survey was sponsored by the National Center for Education Statistics with funding for an oversample of Hispanics from the Office for Bilingual Education and Minority Language Affairs and the Office of Civil Rights. The study is based on a national probability sample of high school sophomores and seniors enrolled in public and private schools in the fall of 1980. Students were selected through a two-stage stratified sampling plan. The base year sample consisted of 30,030 sophomore and 28,240 seniors enrolled in 1,015 schools, reflecting an 85% completion rate, after a 91% school participation rate.

Base year data and data for the first follow-up of sophomore were collected in school with self-administered questionnaires. Later follow-ups were conducted primarily through the mail, with some telephone interviewing. In addition, surveys were completed by the principle: about the school; teachers: about the students; and from a subsample of about 2,500 parents in each cohort in the base year.

A subsample of approximately 14,994 sophomores and 11,995 seniors were included in the follow-up. The follow-up sample also included 495 seniors who were selected for the base year sample but had not participated. Follow-ups were conducted in 1982, 1984, and 1986 and a fourth follow-up of sophomores was conducted in 1992 with a collection of transcripts from post-secondary institutions.

Ortho Birth Control Survey

This survey has been conducted and sponsored by the Ortho Pharmaceutical Corporation each year since 1969, with the most recent data is available from 1994. In 1992, a nationwide sample of 12,500 women aged 15-50, selected from a group of 360,000 households in the contiguous United States were mailed self-administered questionnaires (63% completion among women aged 15-44). One woman was selected per household. This survey is not a random sample of all women; it underrepresents women in the highest income group and non-white women.

National Education Longitudinal Study (NELS:88)

This survey was sponsored by the National Center for Education Statistics with co-funding by the National Science Foundation, and additional sponsorship by the National Endowment for the Humanities, within the Department of Education, the Office of Planning, Budget, and Evaluation and the Office of Bilingual Education and Minority Languages, and Gallaudet University.

This is a national probability sample of eighth graders in 1988 using a two-stage stratified, clustered sample design. Data were collected from 24,599 students in 1,057 public, private and church-affiliated schools in the base year. Students questionnaires were completed in school in group sessions. Data were also collected from the school administrator, teachers, and parents (by mail).

The first follow-up was conducted in 1990 when the students were in tenth grade and the second follow-up in 1992 when they were seniors. Students who dropped out of school were followed. Academic transcripts were also collected in 1992 for each student.

National Health Interview Survey (NHIS)

The survey is designed and funded by the National Center for Health Statistics. The survey is a cross sectional household interview survey covering the civilian, noninstitutional population of the 50 states and the District of Columbia and has been conducted since 1957. The sampling plan follows a multi-stage probability design that permits the continuous sample of households. In-person interviews are conducted each week throughout the year.

In 1985 through 1994, data was collected annually on about 127,000 persons in approximately 49,000 households. The annual response rate is over 90% of the eligible households. Adult members, aged 17 and older, are interviewed and the mother is usually the respondent for children.

National Longitudinal Survey of Youth (NLSY)

The Department of Labor initiated this survey and portions of the surveys were sponsored by the National Institute of Child Health and Human Development, the National Institute on Drug Abuse, the National Institute on Alcohol and Alcohol Abuse, and the Department of Defense.

The youth cohort is a multi-stage probability sample of a nationally representative sample of about 11,400 non-institutionalized men and women who were between the ages of 14 and 21 as of January 1, 1979 and 1,280 young people in the Armed Forces. As of the 1991 interview wave, 90% of the original sample were still eligible for interview. Surveys are conducted in-person annually, with the exception of the 1987 telephone survey.

National Survey of Adolescent Males (NSAM)

This survey was supported by grants from the National Institute for Child Health and Human Development. It is a nationally representative of never married non-institutionalized males, aged 15 to 19, living in households. The sample was drawn for the ISR National Sampling Frame, which is based on the 1980 Census. The initial survey was carried out in 1988 on 1,800 males (74% response rate) and in 1991. 1.676 follow-up interviews were conducted (89% follow-up rate). The survey consisted of a face-to-face interviews, except for a few telephone interviews with respondents who had moved abroad, and a self-administered questionnaire for sensitive questions.

National Survey of Children (NSC)

Funding for this survey was provided by the Foundation for Child Development, the National Institute of Mental Health, the Center for Population Research of the National Institute of Child Health and Human Development, the Office of the Assistant Secretary for Planning and Evaluation of the Department of Health and Human Services, the Robert Wood Johnson Foundation, and the Ford Foundation.

The original 1976 sample was a multi-stage stratified probability sample of households containing children aged 7 to 11. Up to two children in the household were eligible to be in the survey. Data were collected for 2,301 children in 1,747 households (80% completion). In-person interviews were conducted with the child and the parent, usually the mother. Self-administered questionnaires were completed by the teachers.

A subsample of 1,423 were interviewed by telephone in 1981, when children were approximately 12-16. years of age. In 1987, telephone interviews were completed by 1,147 youth, aged 18 to 22. Overall attrition from the initial sample to Wave 3 was 36%.

National Survey of Families and Households (NSFH)

The Center for Population Research of the National Institute of Child Health and Human Development funded both the survey and the five year follow-up. The initial survey took place in 1987 and the follow-up survey began in 1992. One adult per household was randomly selected as the primary respondent and personal interviews were conducted with this person. Spouses and cohabiting partners were given a shorter self-administered questionnaire. In the follow-up survey the following persons will be interviewed: all the original respondents; spouses, current and ex, of the respondent; all focal children who were ages five through eighteen at the time of the first survey; all deceased respondents (a relative will be interviewed); and a randomly selected parent of all respondents, if the parent is age 60 or older.

National Survey of Family Growth (NSFG)

This survey is sponsored by the National Center for Health Statistics, Division of Vital Statistics, Family Growth Survey Branch. Funding for the 1988 survey was provided by the Center for Population Research, National Institute for Child Health and Human Development, the Office of Population Affairs, Office of the Assistant Secretary for Health, the National Center for Health Statistics, Centers for Disease Control, and the Administration for Children, Youth, and Families, Department of Health and Human Services.

Cycle I was collected in 1973 and cycle II in 1976 and represented the civilian household population of women 15-44 years old who lived in the contiguous United States and who were currently or previously married or, if never married, had a child of their own living with them. In 1982, cycle III was expanded to included women of all marital statuses and women living in group quarters. In 1988, cycle IV was further expanded to include women living in Alaska and Hawaii. In 1988, 8,450 women, aged 15 to 44 were interviewed using the National Health Interview Survey sampling frame. Cycles I thru IV consisted of in-person interviews, while a 1990 re-interview was conducted by telephone.

National Survey of Young Men

The National Institute of Child Health and Human Development of the Department of Health and Human Services provided grants to support this survey. This survey was collected in 1979 on a sample of 917 males, aged 17-21, living in households in Standard Metropolitan Statistical Areas (SMSAs) in the continental United States. The sampling scheme involved stratification by race to ensure a substantial number of interviews with blacks. Only one respondent was chosen (by random selection) per household.

Panel Study of Income Dynamics (PSID)

The study was initially funded by the U.S. Office of Economic Opportunity. In 1972, major funding shifted to the Department of Health and Human Services (DHHS). Since 1983, the National Science Foundation has been the principle sponsor, with substantial continuing support from the Office of the Assistant Secretary for Planning and Evaluation of DHHS. Supplementary grants are provided by the Ford, Sloan, and Rockefeller foundations, the National Institute of Child Health and Human Development, the National Institute on Aging, and the Departments of Labor and of Agriculture.

The study is based on a probability sample of about 4,800 U.S. households first interviewed in 1968 with interviews fielded annually since then. It is designed to maintain a representative sample of families at any point in time as well as across time. Members of the 1968 households are tracked as they leave to establish separate family units. As of 1988 the sample consisted of some 7,100 families (37,500 individuals). Since 1975, most interviews have been conducted by telephone and, occasionally, by mail or in person.

Survey of Income and Program Participation (SIPP)/
Survey of Programs Dynamics (SPD)

The survey is funded and conducted by the U.S. Bureau of the Census. A multi-stage stratified sample of the U.S. civilian, non-institutionalized population is used. The first panel was initiated in October 1983 and called for a sample size of approximately 20,000 households per panel. In 1984 the panel size was reduced to 13,00 households per panel, 1990 included approximately 21,500 households and 1991, 14,000 households.

Each household is interviewed once every four months for a period of 2 and a half years. Focus of the survey is adults, aged 15 and older. Beginning in February 1992, waves 1, 2, and 6 are personal interviews but the remaining 5 interviews are conducted by telephone. In 1996 the survey will be a redesign which calls for panels of approximately 50,000 households to be followed for 52 months. It will then be called the Survey of Program Dynamics.

Youth Risk Behaviors Survey (YRBS)

This is a nationally representative school-based sample of 9th to 12 grade students from public and private schools in 50 states and the District of Columbia beginning in 1990. In 1992, a youth risk behavior supplement (YRBS) was included as part of the National Health Interview Survey. This supplement, based on a household sample, provides national data on youth who attend school and those who do not. The sample of 10,645 included children aged 12 to 21 with up to 3 children per household interviewed (77% response rate). The YRBS was sponsored by the Division of Adolescent and School Health, National Center for Chronic Disease Prevention and Health Promotion.